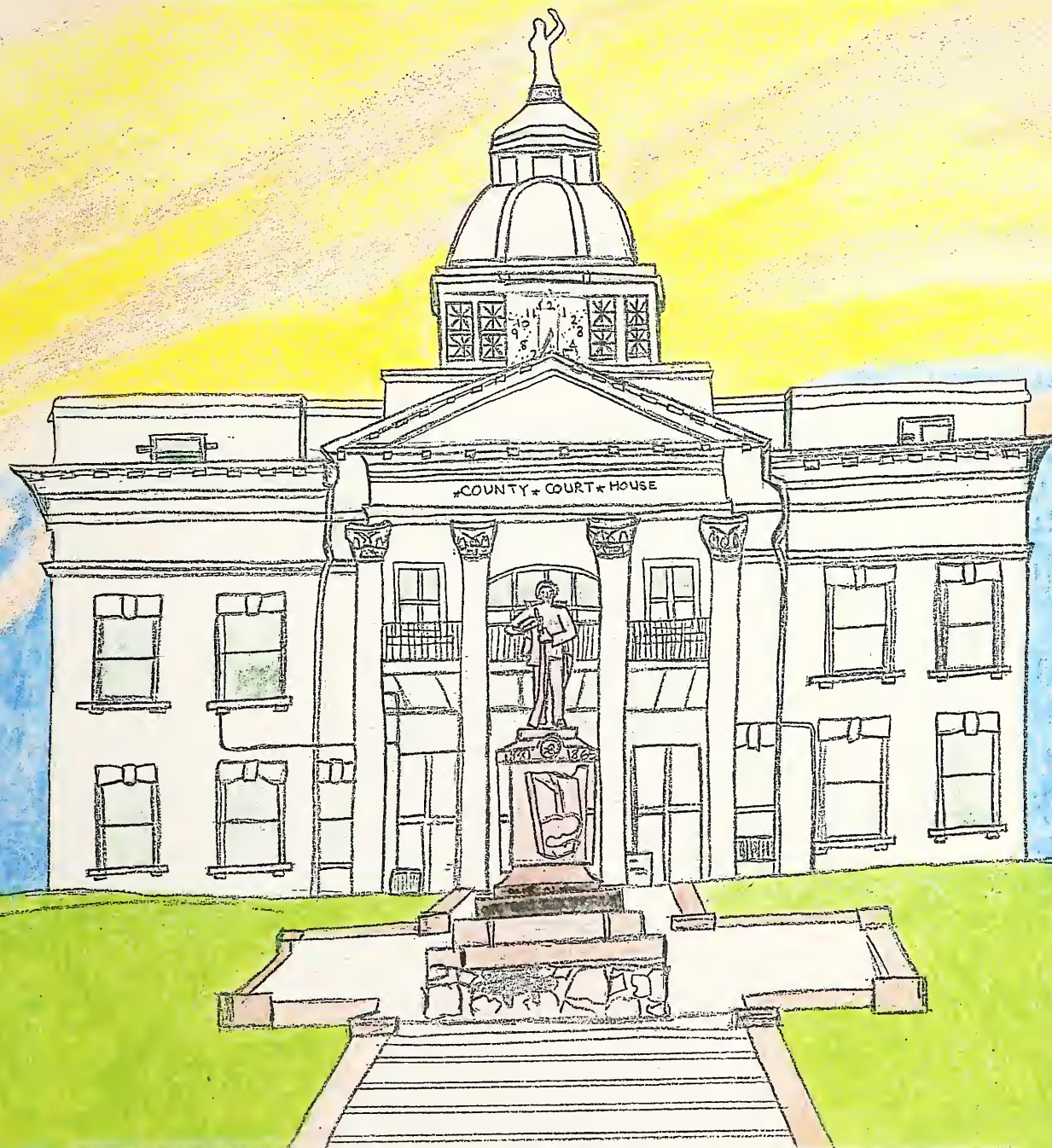




*North Carolina Department of Transportation
Statewide Planning Branch
Systems Planning Unit*

JACKSON COUNTY



THOROUGHFARE PLAN

1994

1994 THOROUGHFARE PLAN
FOR
JACKSON COUNTY, NORTH CAROLINA

Prepared By:

The Statewide Planning Branch
Division of Highways
North Carolina Department of Transportation

In Cooperation With:

Jackson County

The Federal Highway Administration
United States Department of Transportation

January, 1994

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I. INTRODUCTION

The economic and social well-being of a region is largely dependent upon an adequate overall transportation system. Unless people and goods are able to move from one place to another quickly and conveniently, the area becomes dormant and unable to develop to its full economic potential. Realizing the key role that highways play in this transportation system it has become increasingly necessary to develop a good continuous network of national, state, and regional highways which can efficiently handle present and anticipated traffic needs.

The following thoroughfare plan is designed to provide a network of principal arterial roads, minor arterial roads, major and minor collector roads, and local roads which will become the backbone for the county road system.

The proposed system of thoroughfares was developed following the basic principles of thoroughfare planning as described in Section II of this report. Thoroughfares were located based upon field investigation, existing and anticipated land use and population distribution, and topographic conditions. The plan advocates those improvements which are felt to be essential for proper traffic circulation within the current planning period (1993-2015).

Proposed improvements within the county plan will be primarily the responsibility of the Division of Highways. However, Jackson County through the use of subdivision and zoning controls can do much toward the implementation of the plan. Thus, it is desirable that the plan be formally approved by both the County and the Board of Transportation to serve as the mutual official guide in the development of the thoroughfare system.

It should be emphasized that the route studies conducted as part of this thoroughfare planning study were not detailed enough to determine what the ultimate improvement would be, i.e., widening or relocation. The locations shown on the thoroughfare plan should therefore be considered as corridor locations with more detailed studies to actually precede the construction of specific projects.

II. COUNTY THOROUGHFARE PLANNING PRINCIPLES

Purpose of Planning

There are numerous benefits to be gained from thoroughfare planning. The main objective is to assure that the road system will be progressively developed to serve future travel desires fully. Thus, the main consideration in thoroughfare planning is to make provisions for street and highway improvements so that, when the need arises, feasible opportunities to make improvements exist.

Streets, roads, and highways have two primary functions: they provide traffic service and land service. When combined, these two services are basically incompatible. This conflict will not be serious if both traffic and land service demands are low. When traffic volumes are high, access conflicts created by uncontrolled and intensely used abutting property result in intolerable traffic flow friction and congestion.

There are two major benefits derived from thoroughfare planning. First, each road or highway can be designed to perform a specific function and provide a specific level of service. This permits savings in right-of-way, construction, and maintenance costs. It also protects residential neighborhoods by controlling through traffic and it encourages stability in travel and land use patterns. Second, local officials are informed of future improvements and can incorporate them into planning and policy decisions. This will permit developers to design subdivisions in a manner that will not conflict with the thoroughfare plan. It also will direct school and park officials to better locate their facilities and minimize the damage to property values and community appearance that is sometimes associated with road improvements.

County Thoroughfare Planning Concept

The underlying concept of the thoroughfare plan is to provide a functional system of streets, roads, and highways that permit direct, efficient, and safe travel. Different elements in the system are designed to have specific functions and levels of service, thus minimizing the traffic and land service conflict.

In the county plan, elements are designated as either urban or rural. In the urban planning jurisdiction, the local municipality generally has planning jurisdiction. Outside the urban planning area, the county has planning jurisdiction. In those urban areas where no urban thoroughfare plan has been developed, elements are generally designated as rural and under the planning jurisdiction of the county. When a thoroughfare plan is developed for an urban area that has not previously had a plan, the area defined by that plan is considered to be urban and comes under the planning jurisdiction of the municipality.

Within the urban and rural systems, thoroughfare plan elements are classified according to the specific function they are to perform. A discussion of the elements and functions of the two systems follows.

Urban Thoroughfare Classification System

In the urban thoroughfare plan, elements are classified as major thoroughfares, minor thoroughfares, or local access streets. The major thoroughfares are the primary traffic arteries of the urban area providing for traffic movements within, around, and through the area. Minor thoroughfares are designed to collect traffic from the local access streets and carry it to the major thoroughfare system. Local access streets, which may be further classified as residential, commercial, or industrial streets, are designed only to provide access to abutting property. Due to the limited amount of detail that can be shown on a county thoroughfare plan, only urban major thoroughfares are shown.

The radial-loop system is a coordinated system of major thoroughfares that is most adaptable to the desired lines of travel within an urban area. It also is reflected in most urban area thoroughfare plans. The radial-loop system includes radials, crosstowns, loops, and bypasses. Radial thoroughfares provide for travel from points outside to major destinations inside the urban area. Crosstown thoroughfares provide for traffic movements across the central area and around the central business district (CBD). Loop thoroughfares provide for lateral travel movements between suburban areas. Bypasses are designed to carry non-local traffic around and through the area. Occasionally, a bypass with low through traffic volumes can be designed to function as a portion of the urban loop. The radial-loop system and urban thoroughfare classification street system are illustrated in Figure 1.

Rural Thoroughfare Classification System

The rural system consists of those facilities outside the urban thoroughfare planning boundaries. They are classified into four major systems: Principal arterials, minor arterials, major and minor collectors, and local roads. Table 1 indicates generally accepted statewide mileage on these systems.

Rural Principal Arterial System: This system consists of a connected network of continuous routes that serve corridor movements having substantial statewide or interstate travel characteristics. This will be indicated by both the trip lengths and the travel densities. The principal arterial system should serve all urban areas of over 50,000 population and a majority of those with a population greater than 5,000. The Interstate system constitutes a significant portion of the principal arterial system.

Rural Minor Arterial System: This system, in conjunction with the principal arterial system, forms a network that links cities, larger towns, and other major traffic generators such as large resorts. The minor arterial system generally serves intrastate and intercounty travel and travel corridors with trip lengths and travel densities somewhat less than the principal arterial system.

TABLE 1

Rural System Road Mileage Distribution

Systems	Percentage of Total Rural Miles
Principal Arterial System	2-4
Principal Arterial System plus Minor Arterial Road System	6-12
Collector (Major and Minor) Road System	20-25
Local Road System	65-75

Rural Collector Road System: The rural collector routes generally serve intracounty travel rather than statewide travel. This system consists of those routes on which the predominant travel distances are shorter than on the arterial routes. The rural collector road system is subclassified into major and minor collector roads.

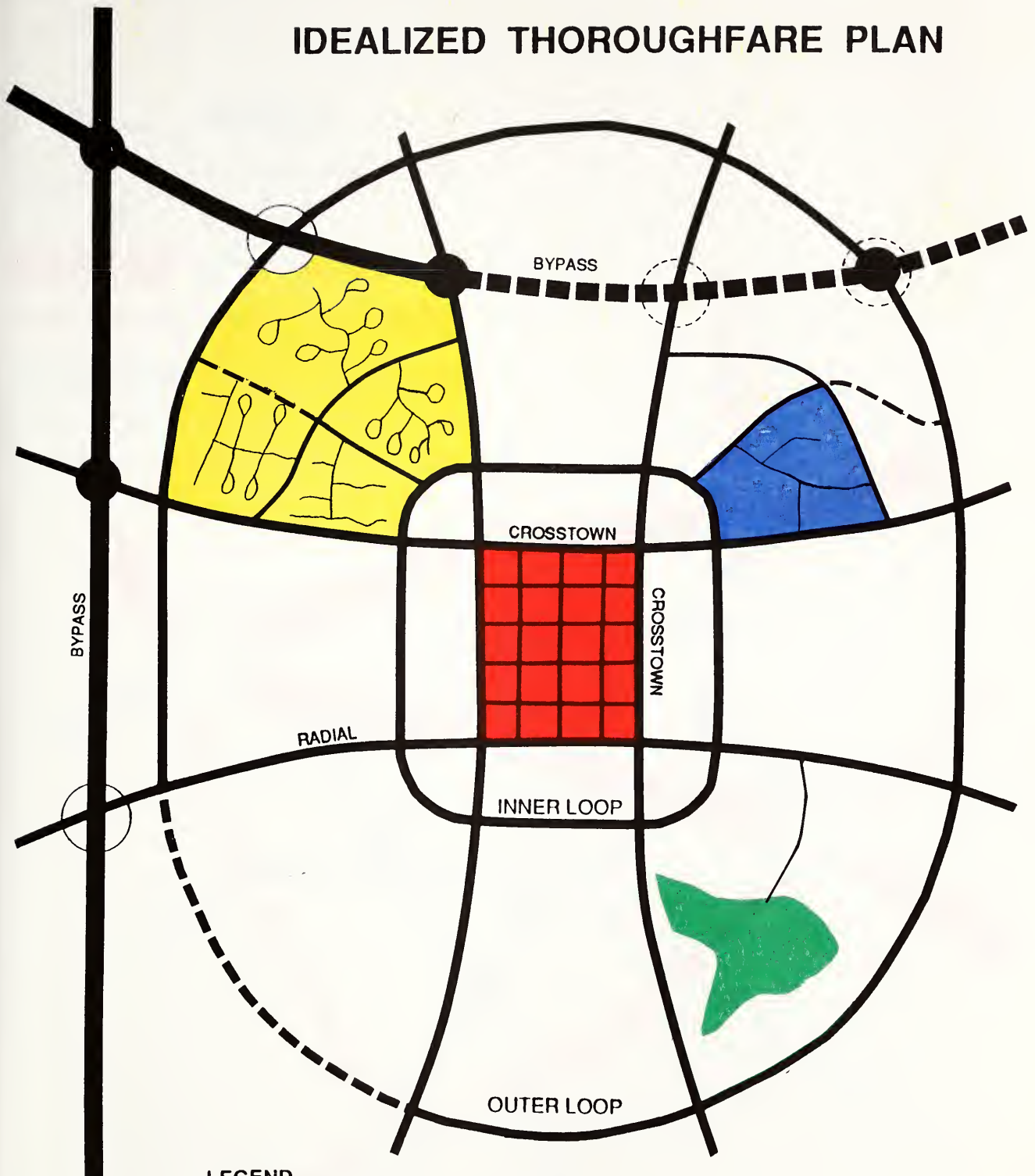
Major Collector Roads: These routes provide service to the larger towns not directly served by the higher systems and to other traffic generators of equivalent intracounty importance, such as consolidated schools, shipping points, county parks, significant mining and agricultural areas, etc. Major collector roads also link these places to routes of higher classification and serve the more important intracounty travel corridors.

Minor Collector Roads: These routes collect traffic from local roads and bring all developed areas within a reasonable distance of a major collector road; provide service to the remaining smaller communities; and link the locally important traffic generators with the rural outskirts.

Rural Local Road System: The local roads are comprised of roads that are not on a higher system. Local residential subdivision streets and residential collector streets are elements of the local road system. Local residential streets are either cul-de-sacs, loop streets less than 2,500 feet in length, or streets less than one mile in length that do not connect thoroughfares or serve major traffic generators and do not collect traffic from more than one hundred dwelling units. Residential collector streets serve as the connecting street system between local residential streets and the thoroughfare system.

Figure 2 gives a schematic illustration of functionally classified rural highway system. The functional classification of the major roads in Jackson County are listed in Chapter V. (Thoroughfare Plan)

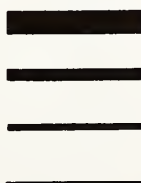
IDEALIZED THOROUGHFARE PLAN



LEGEND

MAJOR THOROUGHFARE
FREEWAY
MAJOR OTHER
MINOR THOROUGHFARE
LOCAL ROAD
INTERCHANGE
GRADE SEPERATION

EXISTING



PROPOSED

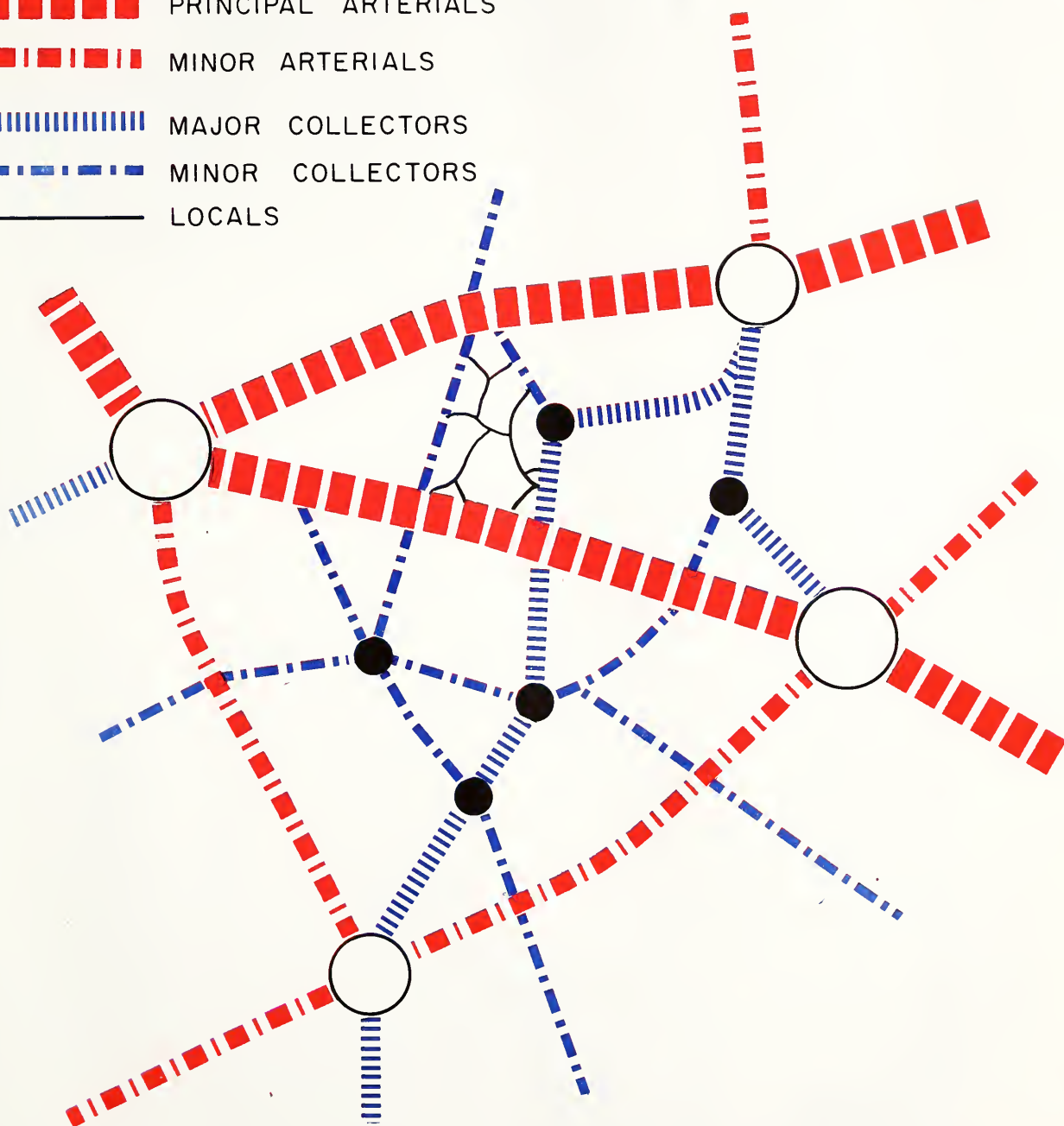
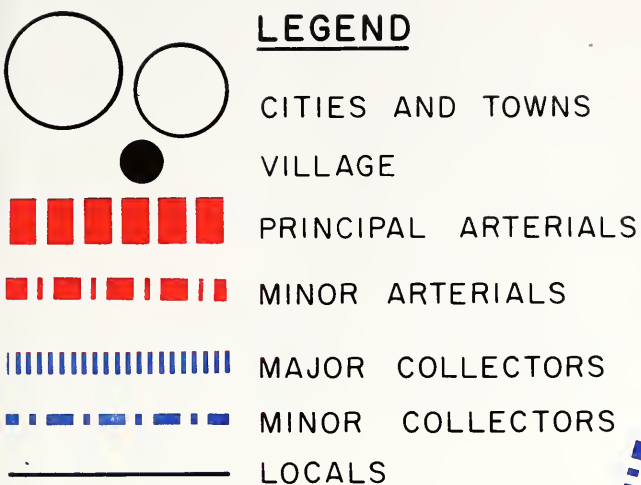


LAND USES



COMMERCIAL/BUSINESS
RESIDENTIAL
INDUSTRIAL
PUBLIC/INSTITUTIONAL

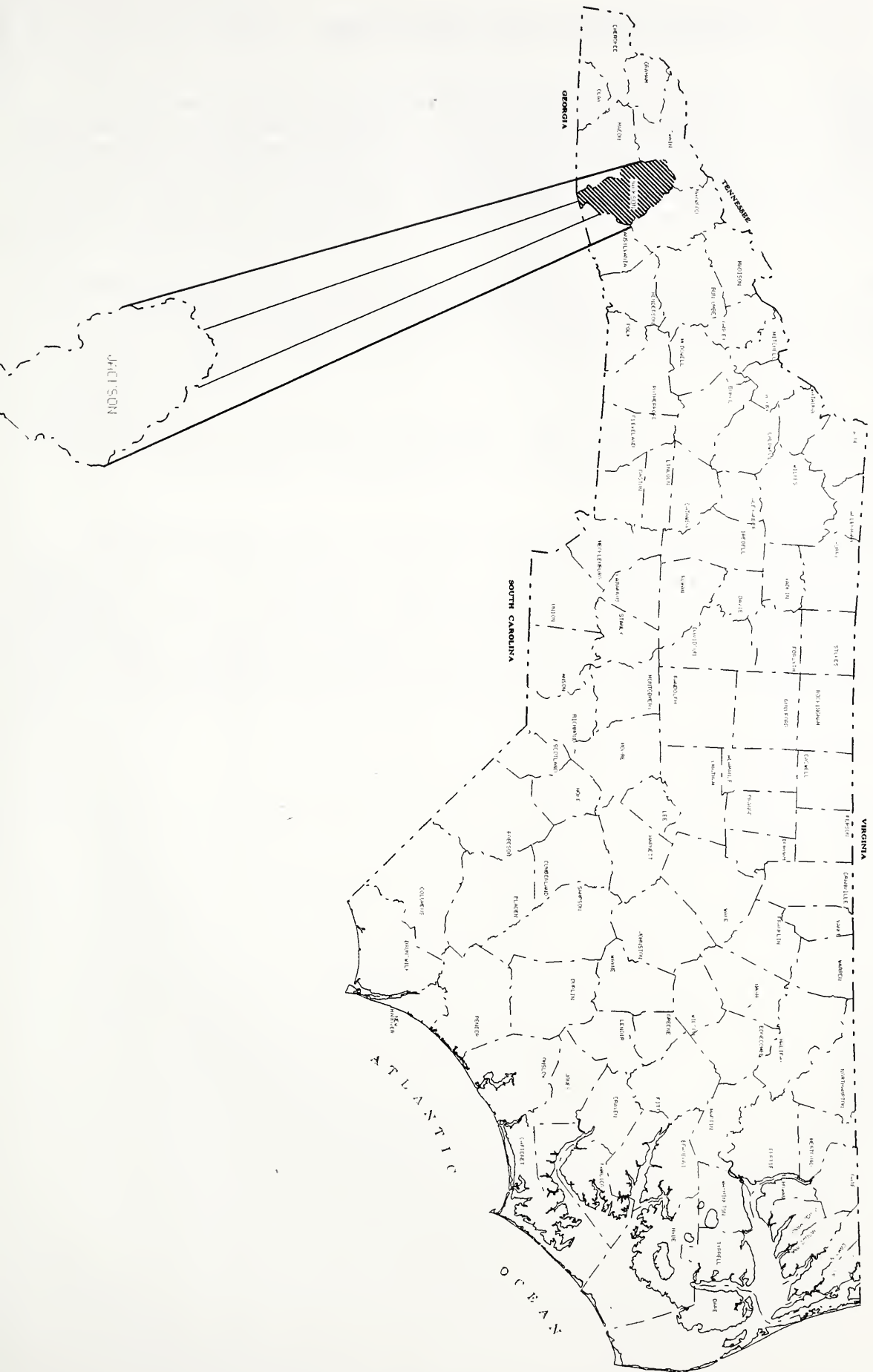
FIGURE 1



SCHEMATIC ILLUSTRATION
OF FUNCTIONALLY CLASSIFIED
RURAL HIGHWAY NETWORK

FIGURE 2

Geographic Location



III. MAJOR URBAN THOROUGHFARE SYSTEMS:

Urban and County Thoroughfare plans are produced to assist officials in the development of the most efficient street system that will handle existing and future travel demands. A proper thoroughfare plan should be devised using the cooperative efforts of the municipality as well as the county. The following towns currently have, or currently are in the process of developing an urban thoroughfare plan.

Cullowhee: Last plan completed in 1967 and revised in 1970. The plan included the NC 107/SR 1001 Bypass. This facility was proposed in efforts of creating a loop system which would almost completely encompass the Western Carolina Campus.

Sylva/Dillsboro: A sketch plan was completed in 1967 and is currently being updated. The 1967 plan included the US 23/US 74 Bypass of Sylva and Dillsboro.

The Institute for Transportation Research Education's (ITRE) Technology Transfer Center is providing transportation planning assistance to the Eastern Band of Cherokee Indians located in Cherokee, North Carolina. The project will include a comprehensive transportation planning study. For the purpose of the Jackson County Thoroughfare Planning Study, the Cherokee Indian Reservation land is excluded from this study and is assumed to be included as part of the study conducted by ITRE.

IV. JACKSON COUNTY - POPULATION, LAND USE, AND TRAFFIC

JACKSON COUNTY

Jackson County lies in the mountainous area of southwestern North Carolina. The approximate land area of Jackson County is 314,000 acres, or 490 square miles. There are five major mountain ranges in the county. The county is bounded on the east by the Balsam Mountain Range and the Tanasee Ridge. The Tanasee connects with the Blue Ridge, while the Blue Ridge lies west across the southern edge of the county to meet the lower range, which forms the western border.

Jackson County is bordered on the south by South Carolina, the southwest by Macon County, the northwest by Swain County, the northeast by Haywood County, and the southeast by Transylvania County.

POPULATION AND GROWTH

Between 1960 and 1990, the total population of Jackson County increased from 17,780 to 26,846. That is an annual compounded growth rate of 1.4%. Overall, the County growth rate represented a 39% increase over the past three decades. Over 40% of Jackson County's population exists in the townships of Cullowhee and the county seat, Sylva.

The projected population for Jackson County is 28,200 for 2010 (furnished by the North Carolina State Data Center). This estimate is based on an annual growth rate of .25%, which is considerably lower than the projected average annual growth rate for North Carolina (.99%). Again, the difference may be offset by the increasing number of permanent retirement residents.

According to State Data Center Technical Report No. 5, there were a total of 11,310 employed residents of Jackson County in 1975. Census counts for 1990 show an increase of 7.0% (12,100) of total employed residents.

In 1992, the US Bureau of Census released County Employment commuting patterns for every county in North Carolina. This data is based on the 1990 Census of Population and Housing survey and should be used as an indicator of the employment travel patterns only. The following is a statistical summary of Jackson County commuting patterns.

Total Out-Commuters	=	3,211
Total In-Commuters	=	1,877
Total Non-Commuters	=	8,889
Persons Working in County	=	10,766
Employed Residents	=	12,100
Net Commuting	=	-1,334

26.54% of employed residents are Out-Commuters.
17.43% of the employed in county workers are In-Commuters.

Table 2 and 3 list the top 5 county commuters, including In-Commuters and Out-Commuters.

**Table 2
In-Commuters
to Jackson County**

Location of Residence	In-Commuters
Haywood County	680
Swain County	407
Macon County	300
Buncombe County	82
Transylvania County	60

**Table 3
Out-Commuters
from Jackson County**

Location of Work	Out-Commuters
Swain County	1,277
Haywood County	534
Macon County	388
Buncombe County	291
Transylvania County	198

LAND USE

Land use in Jackson County is divided into several categories. The most notable categories include: residential; commercial; and industrial. Approximately fifty percent of the permanent residential development in Jackson County have remained concentrated in the townships of Sylva, Dillsboro, Webster, Cullowee, Cashiers, and Indian Hills. Unfortunately, over 80% of the County's commercial and industrial development is located within these same areas. Sometimes associated with such a large concentration of commercial development is strip-development along the traffic corridors. Dense commercial development along arterials such as NC 107, US 23, US 64, and US 19, eventually leads to poor levels of service. This can be attributed to increased curb cuts for driveways and access points for commercial areas. This must be avoided in order to preserve the purpose of the facility. The conflict between a traffic facility's access control and adjacent development have always presented a problem to local planners. The underlying concept is that local planners must be able to coordinate and balance land use and transportation. If development is allowed to continue without proper planning and regulatory measures, than a community's transportation infrastructure will continue to deteriorate. Poor operational characteristics and the high cost of system improvements could lead to the down fall of a community's transportation system.

The land area for Jackson County is 490.6 square miles. Sixteen percent or approximately 50,500 acres of this total is government owned Outdoor Recreational Land Area. Twenty-four percent (approx. 75,000 acres) is maintained by the United States Forest Service, and six percent is owned by the Cherokee Indian Reservation. The following is an outline of the major land uses in Jackson County. This information was provided by the Southwestern North Carolina Resource Conservation and Development Council.

Total Area	316,800
Total Land Area	314,900
Private Forest Land	194,000
Nantahala National Forest (USFS)	68,300
National Parks:	
Great Smokey Mountains	-
Blue Ridge Parkway	3,600
Tennessee Valley Authority	-
Urban and Built-up Land	19,300
Crop and Pasture Land	27,400

(Sources: Soil Conservation Service)

TRAFFIC

The number of registered vehicles in Jackson County for 1990 is 21,527. Forecasting for 2015 has projected the number of vehicles to exceed 28,000. As the number of vehicles increase, it will put a greater strain on the existing road network. Additional traffic volumes will increase safety hazards and congestion. To alleviate traffic congestion, steps must be taken towards building new roads and enhancement of existing facilities.

Vehicle registration has increased at a much greater rate than population since 1940. This increase can be shown best by a graph depicting the change in persons per vehicle ratio over time. This ratio is obtained by dividing the total population of the area by the total number of vehicles registered in that area. **Figure 4** shows this comparison for North Carolina and Jackson County and includes projections to the year 2010.

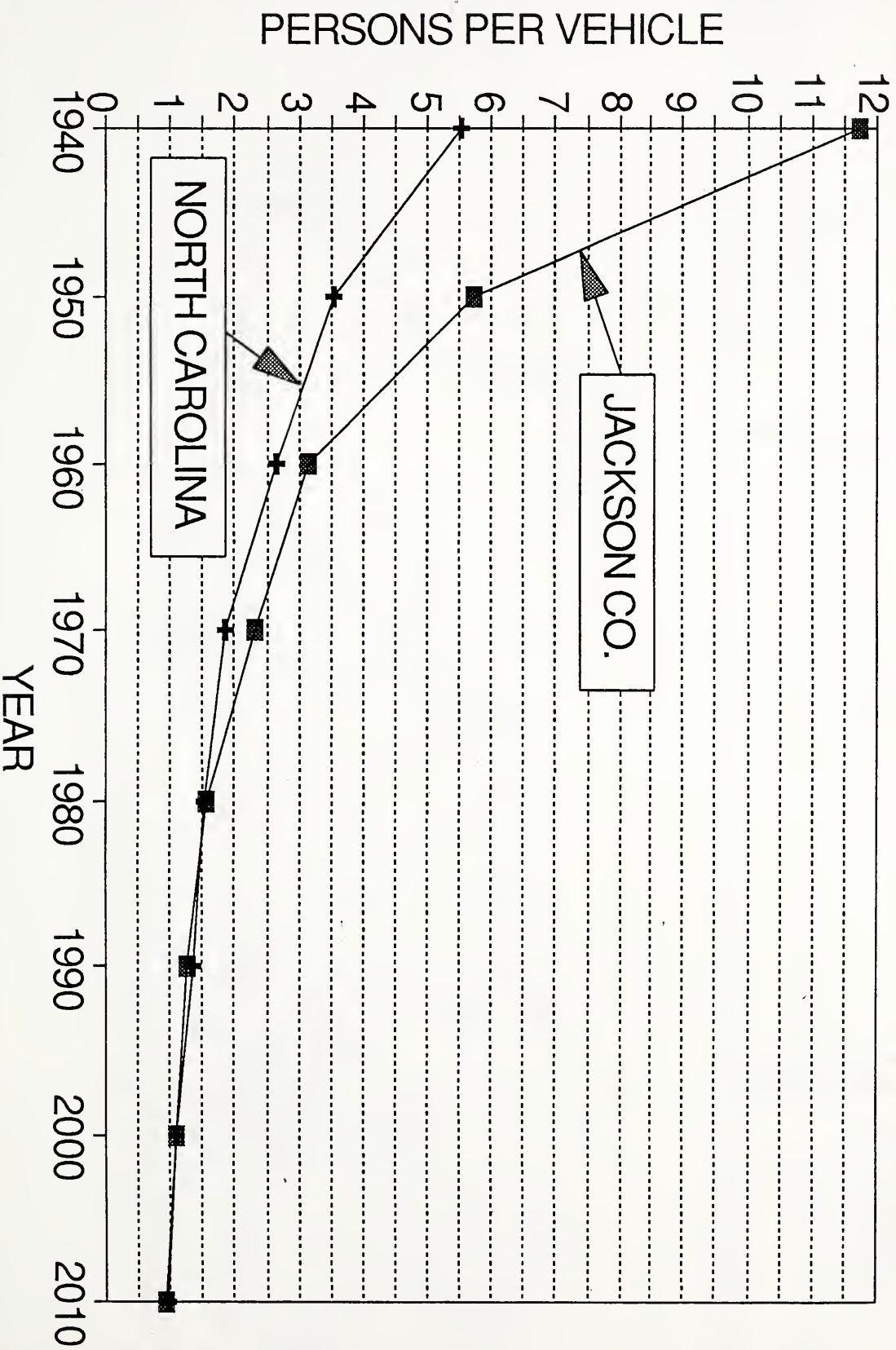
The results of this figure illustrate the transition from a non-automobile oriented society to one whose vitality is heavily dependent on the automobile. This change in lifestyle has gradually occurred over many years, with the most dramatic difference being between 1940 and 1960. This is primarily due to: the post-depression increase in the standard of living; the increase in population including the post World War II "Baby Boom"; the transition from an agriculturally dominated society to a more diversified one (fewer people on the farm, greater need for transportation); and the availability of automobiles in the 1960's and 1970's and the banking credit to buy them.

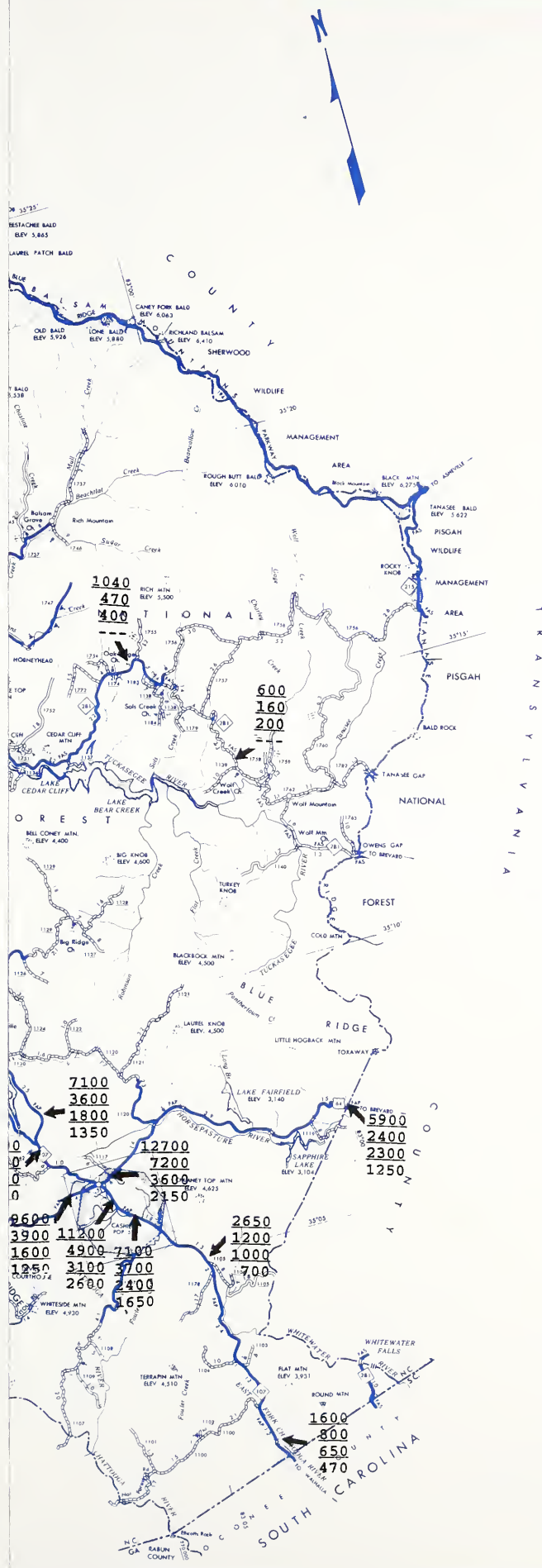
On the basis of the forecasted population and motor vehicle registration trends, traffic volumes on most roads in the County should experience a significant increase in traffic during the 1990-2015 design period. Greater increases are to be expected due to continued dramatic increases in tourism and retirement.

In the analysis of historical traffic counts for Jackson County, several primary and secondary road traffic volumes were projected for the design year of 2015. For each location on a given road, Average Daily Traffic (ADT) counts for the past twenty years were used in a linear regression analysis to estimate future ADT counts. Graphical trend lines for each location assisted in the analysis by estimating future ADT counts through a computer generated program.

The counts for each location were then adjusted depending on population growth, registered vehicles, tourism, and the planned development for that area. This step allows for more accurate representation of traffic volumes. **Figure 5** shows the Average Daily Traffic (ADT) volumes for selected locations throughout Jackson County. For each location, present and projected ADT's are shown.

PERSONS PER VEHICLE JACKSON COUNTY





HISTORIC AND PROJECTED ADT VOLUMES

LEGEND

2015 ADT
1992 ADT
1982 ADT
1975 ADT

FIGURE 5

JACKSON COUNTY

NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-STATEWIDE PLANNING BRANCH

IN COOPERATION WITH
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE
1 INCH = 1 MILE
0 1 2 3 4 MILES
0 0.5 1 MILE
SCALE FOR ENLARGEMENTS

BASE: 1993

TABLE 4

**HISTORICAL AND PROJECTED AVERAGE DAILY TRAFFIC VOLUMES
FOR SELECTED LOCATIONS IN JACKSON COUNTY**

LOCATION	1975	1982	1992	2015
US 23/US 441:				
@ MACON COUNTY LINE	4,500	4,500	8,400	16,800
@ SR 1311 (CABE ROAD)	-----	5,100	8,500	16,780
@ SOUTH OF NC 116	-----	6,500	11,800	23,810
@ NORTH OF NC 116	-----	-----	9,200	16,800
URBAN PLANNING AREA FOR SYLVA/DILLSBORO				
US 74:				
@ SR 1471 (OLD US 19A-23)	6,200	8,900	11,900	23,500
@ SOUTH OF SR 1461 (CRAW- FORD CEMETERY)	-----	8,100	13,600	26,850
@ SR 1465 (HOOD ROAD)	-----	8,000	12,900	22,750
URBAN PLANNING AREA FOR SYLVA/DILLSBORO				
@ EAST OF US 441	4,600	7,600	10,900	22,490
@ EAST OF SR 1531 (Old US19)	2,600	4,500	7,900	13,950
@ SWAIN COUNTY LINE	-----	-----	6,800	12,000
US 441:				
@ SWAIN COUNTY LINE	4,100	-----	6,300	13,900
US 64:				
@ TRANSYLVANIA COUNTY LINE	1,250	2,300	2,400	5,900
@ SR 1116 (MERRELL ROAD)	2,150	3,600	7,200	12,700
@ WEST OF CASHIERS	1,250	1,600	3,900	9,600
@ MACON COUNTY LINE	1,200	1,500	2,700	5,950
NC 107:				
@ S.C STATE LINE	470	650	800	1,580
@ SR 1105 (SILVERMINE ROAD)	700	1,000	1,200	2,650
@ SOUTH OF SR 1107 (WHITE SIDE COVE)	730	750	1,800	3,550
@ NORTH OF SR 1118 (ZACKERY CEMETERY)	1,650	2,400	3,700	7,100
@ SR 1112 (CASHIERS SCHOOL)	2,350	3,300	4,000	7,900
@ SR 1114 (VALLEY ROAD)	2,600	3,100	4,900	11,200
@ NORTH OF US 64	1,900	2,700	5,500	12,130
@ NORTH OF SR 1145 (YELLOW MOUNTAIN ROAD)	1,350	1,800	3,600	7,100
@ SR 1157 (CULLOWHEE MTN)	1,600	1,500	2,700	5,330
@ NC 281	550	700	1,200	2,400
@ SR 1774 (EVANS ROAD)	-----	9,000	15,400	34,000
@ SOUTH OF NC 116	6,900	10,000	19,600	38,700
@ NORTH OF NC 116	-----	12,300	22,800	40,250

TABLE 4A				
HISTORICAL AND PROJECTED AVERAGE DAILY TRAFFIC VOLUMES FOR SELECTED LOCATIONS IN JACKSON COUNTY				
LOCATION	1975	1982	1992	2015
NC 116:				
@ EAST OF US 23/US 441	-----	900	2,500	4,400
@ SR 1360	-----	1,000	2,700	4,750
@ EAST OF SR 1367 (BUTTE RD	1,200	1,600	3,500	6,900
@ EAST OF SR 1348 (BUCHANAN LOOP ROAD)	-----	2,300	4,400	10,000
@ NC 107	2,400	4,000	7,600	16,800
NC 281:				
@ SR 1754 (OAKHILL CHURCH)	-----	400	470	1,040
@ SR 1139 (PIONEER LODGE)	-----	200	160	600

CAPACITY ANALYSIS OF EXISTING MAJOR ROAD SYSTEM

The road network in Jackson County was analyzed to determine if the existing roads were able to adequately handle the existing traffic. The process calls for the comparison of volume to capacity ratios. The capacity of a particular road is dependent on levels of service (operating speeds) and pavement width. When the existing volumes for roads outside of urban areas were compared to those capacities, it was found that no road was over-capacity.

When existing capacities were compared to projected volumes for the year 2015, the following roads were anticipated of having capacity problems.

- US 64 from SR 1141 (SLAB TOWN ROAD) to SR 1116 (MERRELL ROAD).
- NC 107 from SR 1112 (CASHIERS SCHOOL) to SR 1141 (SLAB TOWN ROAD).
- NC 107 from SR 1001 (SPEEDWELL ROAD) to 0.39m North of SR 1001.
- NC 107 from existing 4-lane divided cross-section to Sylva East City Limits (Urban Planning Boundary).

There are a number of major roads in the County that have widths of 16 and 18 feet. Standards established by the American Association of State Highway and Transportation Officials (AASHTO) set 20 feet as a minimum width with 24 feet as a preferred width. However, because of the substantial cost of upgrading all secondary roads to AASHTO standards, narrower widths are tolerated depending upon traffic volumes. The roads on the thoroughfare plan that have inadequate width deficiencies are listed in Appendix A, Table A1. The minimum widths needed for upgrading them to AASHTO standards are given as recommended cross sections.

TRAFFIC SAFETY

The Traffic Engineering Branch of the North Carolina Department of Transportation releases an annual Accident Investigation list. The list is a statewide ranking of accident locations. The criteria for selection is based on locations having 25 or more accidents in the past three years, at least eight must occur in the most recent year. For Jackson County there were no rural intersections ranked on the 1992 list.

Listed in **Table 5** are intersections in rural Jackson County with five or more accidents occurring between January, 1990 through May, 1993.

TABLE 5	
HIGH ACCIDENT LOCATIONS	
General Location:	No. of Accidents
NC 107 at NC 116	12
NC 107 at SR 1001	8
NC 107 at SR 1002	14
NC 107 at SR 1112	5 *
NC 107 at SR 1145	7
NC 107 at SR 1325	18
NC 107 at SR 1330	6
NC 107 at SR 1350	5
NC 107 at SR 1367	5
NC 107 at SR 1724	7
SR 1002 at SR 1169	7
SR 1002 at SR 1732	11
SR 1169 at SR 1325	12

* Fatality involved

BRIDGE CLASSIFICATIONS

Bridges are a vital and unique element of a highway system. First, they represent the highest unit of investment of all elements of the system. Second, any inadequacy or defect in a bridge reduces the value of the total investment. Third, a bridge represents the greatest opportunity of all potential highway failures. Finally, and most important, a bridge represents the greatest opportunity of all highway failures for loss of life. For these reasons it is imperative that bridges be constructed to the same design standards as the highway system.

Congress enacted the National Bridge Inspection Program Standards on April 27, 1971, implementing the Federal Highway Act of 1968. These standards require that "all structures defined as bridges located on any of the Federal-Aid Highway Systems be inspected and the safe load carrying capacity computed at regular intervals, not to exceed two years."

The North Carolina Department of Transportation Bridge Maintenance unit set forth standards for evaluating existing bridge structures. A sufficiency index number has been calculated for each bridge for the purpose of establishing eligibility and priority for replacement. The bridges with the highest priority are replaced as Federal-Aid funds and State funds are made available.

A sufficiency rating was used in the analysis to determine the deficiency of each bridge. The sufficiency rating is a method of evaluating factors that determine whether a bridge is sufficient to remain in service. Factors used include: structural adequacy and safety, serviceability and functional obsolescence, essentiality for public use, type of structure, and traffic safety features. The result of this method is a percentage. One hundred percent represents an entirely sufficient bridge and zero percent represents an entirely insufficient or deficient bridge. A sufficiency rating of 50 percent or less qualifies for Federal Bridge Replacement Funds.

The coding guide for North Carolina Bridge Inventory is based on the standards set forth by the Federal Highway Administration (FHWA).

The two different classifications for bridges in need of rehabilitation are as follows:

- Structurally Deficient: Condition rating of 4 or less for either of the following:
- Deck Superstructure - Substructure
- OR
- An appraisal rating of 2 or less for either of the following:
- Structural Condition
 - Waterway Adequacy
- Functionally Obsolete: An appraisal rating of 3 or less in either of the following:
- Structural condition
 - Waterway adequacy
 - Deck Geometry
 - Under Clearance
 - Approach Roadway Alignment

Tables 6 and 7 show structurally deficient and functionally obsolete bridges with sufficiency ratings of 50 percent or less. Only those bridges with ratings of 50 percent or less are eligible for federal bridge replacement funds. The locations of these bridges are in **Figure 6**.

TABLE 6**Structurally Deficient Bridges in Jackson County**

Rank	Sufficiency Rating	Bridge No.	Features Intersected
1	16.2	* 303	SR 1381 @ SOUTHERN RAILRD.
2	19.7	189	SR 1145 @ HURRICANE CREEK
3	33.1	261	SR 1708 @ SUTTON BRANCH
4	33.7	357	SR 1788 @ BLANTON BRANCH
5	34.7	322	SR 1316 @ E FORK SAVANNAH CREEK
6	38.8	123	SR 1437 @ SCOTTS CREEK
7	39.7	13	SR 1144 @ GRASSY CAMP CRK.
8	43.4	* 193	SR 1157 @ THORPE DAM SPILLWAY
9	43.4	136	SR 1163 @ BIG PINE CREEK
10	44.3	27	US 23BUS@ SCOTTS CREEK & SOUTHERN RAILR.
11	45.3	129	SR 1445 @ SCOTTS CREEK
12	46.5	328	SR 1739 @ MOSES CREEK
13	47.5	47	SR 1131 @ TROUT CREEK
14	47.9	26	SR 1468 @ SCOTTS CREEK

* Included in the 1994-2000 Transportation Improvement Program.

TABLE 7**Functionally Obsolete Bridges in Jackson County**

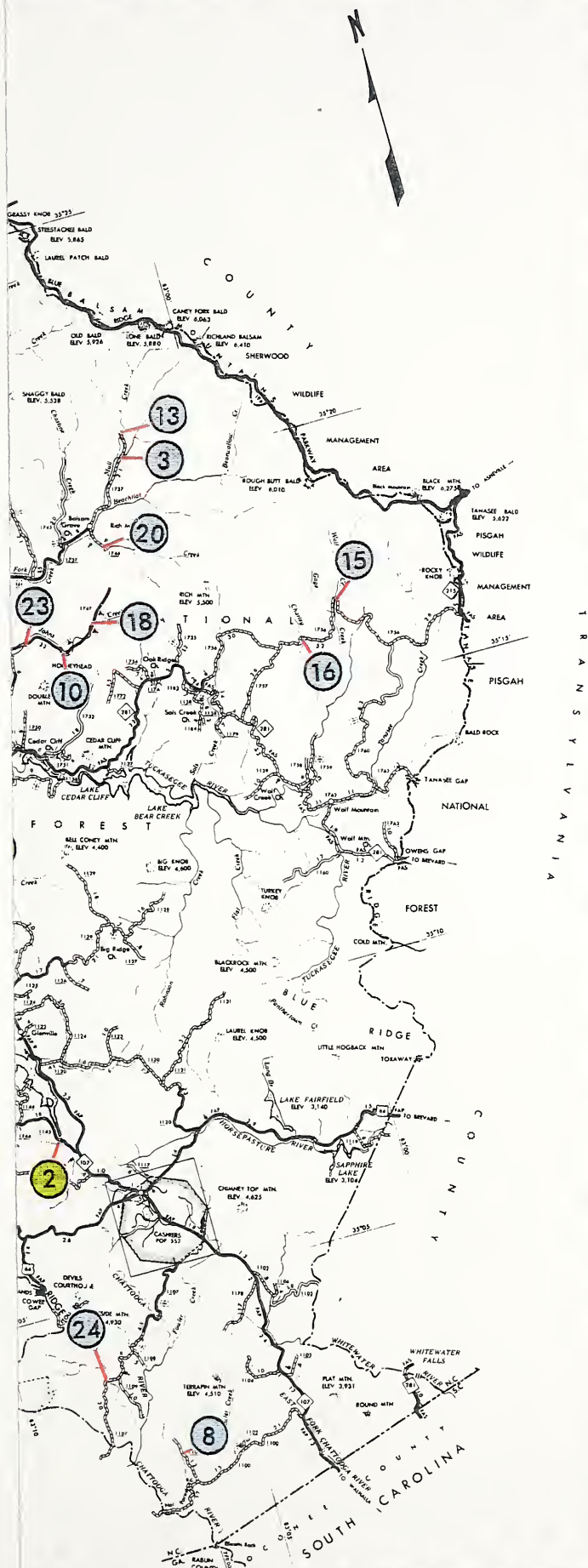
Map Index	Sufficiency Rating	Bridge No.	Location
1	33.6	107	SR 1731 @ TUCKASEGEE RIVER
2	36.0	146	SR 1370 @ GREEN'S CREEK
3	39.3	92	SR 1737 @ MULL CREEK
4	42.3	99	SR 1447 @ FISHER CREEK
5	42.3	101	SR 1740 @ CANEY FORK CREEK
6	42.4	164	SR 1462 @ WOODFIN CREEK
7	42.9	138	SR 1157 @ PRESSLEY CREEK
8	43.1	323	SR 1101 @ SCOTSHMAN CREEK
9	43.9	103	SR 1740 @ MOSES CREEK
10	44.2	87	SR 1747 @ JOHN'S CREEK
11	44.5	98	SR 1446 @ FISHER CREEK
12	44.7	33	SR 1457 @ BUFF CREEK
13	45.5	93	SR 1737 @ MULL CREEK
14	45.8	39	NC 107 @ E. FORK TUCKASEGEE
15	46.0	*167	SR 1756 @ WOLF CREEK
16	46.1	* 76	SR 1756 @ CHARLIES CREEK

* Included in the 1994-2000 Transportation Improvement Program

TABLE 7A**Functionally Obsolete Bridges in Jackson County**

Map Index	Sufficiency Rating	Bridge No.	Location
17	46.3	143	SR 1705 @ RT. PRONG SCOTTS CREEK
18	46.5	182	SR 1747 @ JOHNS CREEK
19	46.6	29	SR 1456 @ SCOTTS CREEK
20	46.6	200	SR 1746 @ SUGAR CREEK
21	46.8	321	SR 1314 @ E.F. SAVANNAH CREEK
22	47.3	186	SR 1371 @ GREENS CREEK
23	47.9	86	SR 1747 @ JOHNS CREEK
24	48.5	3	SR 1107 @ CREEK
25	49.4	69	SR 1300 @ PUMPKIN TOWN CREEK
26	49.4	319	SR 1432 @ OVER RELIEF
27	49.7	196	SR 1388 @ LEFT PRONG DICKS CK
28	50.0	45	IRR US19 @ SOCO CREEK

* Included in the 1994-2000 Transportation Improvement Program



Structurally Deficient and
Functionally Obsolete Bridges

FIGURE 6

JACKSON COUNTY

NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS-STATEWIDE PLANNING BRANCH

IN COOPERATION WITH

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION



BASE: 1993

ENVIRONMENT, HISTORICAL LANDMARKS, AND ENDANGERED SPECIES

Throughout the study a major concern was the effects of development on the environment. Any proposed facility on new location whether it is a bridge or highway will have a direct effect on its surroundings. Since a major resource for Jackson County is cropland, it is desirable to limit any unnecessary highway development in rural areas. Any proposed project, whether it is a new facility or simple widening will have an environmental evaluation conducted to determine the projects impact on its surrounding environment.

The thoroughfare plan has taken into consideration several historical landmarks. Fourteen historical locations are scattered throughout Jackson County. All fourteen sites are included on the National Register.

Further steps were taken in conserving endangered and threatened wildlife and plants. The N.C. Natural Heritage Program provided information and listings of elements (rare species, geologic features, natural communities, special animal habitats) known to occur in the geographic area of interest. Federal and State laws protect most endangered plant and wildlife with conservation acts. It was therefore necessary to work with the National Heritage Program in avoiding interference or disturbance of any natural habitation.

TRANSPORTATION IMPROVEMENT PROGRAM

The North Carolina Transportation Improvement Program (TIP) was organized to inform North Carolina citizens of any developments in the State Highway System. Approved by the Board of Transportation, the Department encourages any local input into the planning process for the TIP.

The highway portion of the TIP includes some of the projects needed to complete the remaining 1,704 miles of four-lane highways on the 3,600 mile Intrastate System. Once completed, 96 percent of the State's citizens will be within 10 miles of a modern four-lane highway. The program also contains multi-lane connector routes and loop roads around seven of the State's major urban areas. In addition, projects that address the most critical local and regional transportation needs are included in the program - to the extent available funding would allow.

The following is a list of projects that are scheduled in the 1994-2000 Transportation Improvement Program (TIP) for Jackson County.

1. US 19 - Cherokee to Maggie Valley. Upgrade existing two lane facility from 20' to 24' pavement width. Ten foot paved shoulder improvements are included. (Scheduled for Right-of-Way protection, TIP #: R-2209)

2. US 64 - Cashiers to Rosman. Upgrade existing two lane roadway and construct climbing lanes. The widening of US 64 to 24'-wide standards will also include 3-lane sections to allow for passing of slower vehicles. (Scheduled post year (1999) construction, TIP #: R-2409)
3. NC 107 - Cashiers to South of East Laport. Construct climbing lanes (3-lane sections) in three locations. (Scheduled for construction in fiscal year 1996, TIP #: R-2224)
4. NC 281 - SR 1756 in Jackson County to north of SR 1307 in Transylvania County. Pave roadway to secondary road standards. (22'-wide pavement with approximately 4' unpaved shoulders) (Scheduled for partial construction in fiscal year 1996, TIP #: R-619)
5. US 64 - Macon County line to west of SR 1119. Install guardrail at select locations. (Scheduled for construction in fiscal year 1994, TIP #: W-2926)
6. US 64 - West of SR 1119 to the Transylvania County line. Install guardrail at select locations. (Scheduled for construction in fiscal year 1995, TIP #: W-2943)
7. NC 107 - SR 1158 to SR 1132. Install guardrail at select locations. (Scheduled for construction in fiscal year 1994, TIP #: W-2923)
8. NC 107 - SR 1132 to SR 1737. Install guardrail at select locations. (Scheduled for construction in fiscal year 1994, TIP #: W-2933)

NOTE: All Schedules are subject to availability of funds.

Design Requirements

Design requirements for thoroughfares vary according to the desired capacity and level of service to be provided. Universal standards in the design of thoroughfares are not practical. Each road or highway section must be individually analyzed and its design requirements determined by the amount and type of projected traffic, existing capacity, desired level of service, and available right of way.

The level of service is a function of the ease of movement experienced by motorists using the facility. (See Appendix A) The ability of a motorist to drive at a desired speed is dependent upon many factors. Included are the physical design of the road, the amount and character of traffic control devices, the influence and character of traffic generated by abutting property, and the imposed speed restrictions. The level of service is generally indicated by the overall travel speed experienced by traffic. Recommended minimum levels of service for roads and highways included in the proposed Jackson County Thoroughfare Plan are given in Table 8.

TABLE 8**Minimum Levels of Service for Roads and Highways**

Facility	Overall Travel Speed During Peak Travel Conditions
-----	-----
Major and Minor Arterials	50-55 MPH
Major Collector Roads	45-50 MPH
Minor Collector Roads	40 MPH

For driver convenience, ease of operations, and safety, it would be desirable to widen all existing roads and highways to provide a minimum lane width of 12 feet. However, when considering overall statewide needs and the available highway revenue, it is found that these levels of improvement applied statewide would be impractical. Therefore, it is necessary to establish minimum tolerable widths for existing roads with respect to traffic demands that would be economically feasible. The widths used in determining the existing lane deficiencies in the County are given in Table 9.

TABLE 9**Minimum Tolerable Lane Widths (in feet)**

ADT	Principal Arterials	Minor Arterials	Collectors
-----	-----	-----	-----
over 2,000	11	11	11
400 - 2,000	-	10	10
100 - 400	-	10	9
below 100	-	-	9

V. THOROUGHFARE PLAN

The recommended thoroughfare plan for Jackson County is shown in **Figure 7**. The corresponding construction plan, which highlights each proposal is shown in **Figure 8**.

Principal Arterials:

The following principal arterials serve primarily interstate and statewide travel.

- US 23 - From Macon County to Haywood County. No improvements necessary.
- US 74 - From Sylva/Dillsboro Urban Planning Area to Swain County. No improvements necessary.

Minor Arterials:

Minor arterials aid principal arterials by helping form a network which links larger towns and cities in the State. The minor arterials for Jackson County are:

- US 64 - From Macon County to Transylvania County. This facility does not meet the minimum tolerable lane width requirement and should be widened from 18' to 24'-wide facility from Macon County to SR 1141 (Slab Town Road). In addition, US 64 within the urban area of Cashiers, should be widened from 2-lanes to a 3-lane, 36'-wide facility from SR 1141 to SR 1116 (Merrell Rd). The additional lane would allow left turning vehicles to progress without delay to through trip traffic. (See TIP #2, #5, and #6)

- US 64 from Macon County to Transylvania County should include 2 feet of paved shoulders for bicycles. This recommendation is contingent upon acceptance by the Office of Bicycle and Pedestrian Transportation (NCDOT).

- US 441 - From US 74 to Swain County. No improvements necessary.

- US 441 Business - From US 441 to US 19. No improvements necessary.

- NC 107 - From South Carolina to Sylva/Dillsboro Urban Planning Area. This facility does not meet the minimum tolerable lane width requirement and should be widened from 18' to 24'-wide facility from SCL of Cashiers to SR 1001. A 0.9 mile section of NC 107 should be widened from 18' to a 3-lane, 36'-wide facility from SR 1112 (Cashiers School) to SR 1141 (Slab Town Road). The additional lane would allow left turning vehicles to progress without delay to through trip traffic.

A portion of NC 107 from 0.14 miles south of NC 116 to the ECL of Sylva has become a vitally important link between Sylva/Dillsboro and the southern half of Jackson County. This segment of NC 107 will reach its capacity of 40,000 vehicles

per day within the design year of 2015. NC 107 provides service not only to Sylva commercial area, but to the Principal Arterial System of Jackson County. Understanding the function of this facility, it is important that access along this facility be protected. It would be undesirable to widen this segment from the present 5-lanes to a 7-lane facility. Allowing continuous left-hand turns on a 7-lane section only compounds safety hazards. For example, a vehicle desiring to make a left turn from the middle lane would be required to wait for an acceptable gap within the opposing traffic stream, then progress across three lanes of traffic. If this situation is applied during peak hour traffic the problems are even more evident.

This 1.77 mile segment of NC 107 should be improved to a 6-lane divided facility. This improvement would be twofold:

- First, it would increase the capacity of NC 107 from 40,000 vpd to approximately 55,000 - 60,000 vpd.
- It would increase safety along NC 107 by limiting the hazardous weaving movements. Left turning vehicles would be allowed by providing median cross-over at signalized intersections and predesignated median cuts. (See TIP #3, #7, and #8)
- NC 107 from Sylva Planning Boundary to US 64 should include 2 feet of paved shoulders for bicycles. This recommendation is contingent upon acceptance by the Office of Bicycle and Pedestrian Transportation (NCDOT).

Blue Ridge Parkway - Federal Highway jurisdiction.

Collector Road System

The major collector roads will assist the arterial system by providing an interconnecting network between smaller populated centers and feed this traffic to the arterial systems. The minor collector roads will provide the link between local roads and higher system roads.

Major Collectors:

NC 116 - From US 23 to NC 107. This facility should be widened to a 24'-wide facility from US 23 to the historic district of Webster. The entire section of NC 116 should include 2 feet of paved shoulders for bicycles. This recommendation is contingent upon acceptance by the Office of Bicycle and Pedestrian Transportation (NCDOT).

NC 215 - From Transylvania County to Transylvania County. No improvements necessary.

NC 281 - From NC 107 to Transylvania County. No improvements necessary. (See TIP #4)

Minor Collectors:

- SR 1001 (Speedwell Road): From NC 107 to Macon County. This facility should be widened to a 24'-wide facility from NC 107 to Macon County. SR 1001 should include 2 feet of paved shoulders for bicycles. This recommendation is contingent upon acceptance by the Office of Bicycle and Pedestrian Transportation (NCDOT).
- SR 1002 (Old 107): From NC 107 to NC 107 (East Laport). This facility should be widened to a 24'-wide facility from NC 107 to NC 107 (East Laport). SR 1002 should include 2 feet of paved shoulders for bicycles. This recommendation is contingent upon acceptance by the Office of Bicycle and Pedestrian Transportation (NCDOT).
- SR 1145 (Yellow Mountain Road): From SR 1157 to NC 107. No improvements necessary.
- SR 1157 (Cullowhee Mountain Rd): From SR 1001 to NC 107. Although the projected traffic volumes on Cullowhee Mountain Road do not exceed its present capacity, it is recommended that a 2.3 mile section (unpaved) of this facility be paved to 20'-wide standards. This facility provides an alternative route to NC 107 and would relieve traffic on NC 107 during times of congestion or emergency.
- SR 1340 (Ash Settlement): From NC 116 to NC 107. This facility does not meet the minimum tolerable lane width requirement and should be widened from 16' to 22'-wide facility from 0.22 miles south of NC 116 to 2.33 miles south of NC 116.
- SR 1397 (Valley Rd): From Swain County to SR 1534 (No Name). No improvements necessary.
- SR 1416 (Shoal Creek Rd): From SR 1531 (Old US 19A) to US 441. No improvements necessary.
- SR 1424 (Olivet Church): From US 441 to SR 1427 (Olivet Loop Rd). No improvements necessary.
- SR 1427 (Olivet Loop Road): From SR 1424 to US 19. No improvements necessary.
- SR 1432 (Skyline Drive): From Sylva/Dillsboro Planning area to US 23. No improvements necessary.
- SR 1531 (Old US 19A): From SR 1416 to US 74. No improvements necessary.
- SR 1534 (No Name): From SR 1397 (Valley Rd) to US 74. No improvements necessary.

Other Projects:

The following locations are functionally classified facilities that have inadequate, but tolerable lane widths. All of the following locations have relatively low Average Daily Traffic volume. The cost of upgrading these facilities is far greater than the overall benefit. It is therefore recommended that no lane width improvements be made at this time. However, a benefit/cost analysis for widening these facilities should be conducted at a later date, preferably when higher ADT counts warrant additional lane width.

- SR 1145 (Yellow Mountain Rd): From SR 1157 to NC 107.
- SR 1157 (Cullowhee Mountain Road): From SR 1001 to NC 107.
- SR 1397 (Valley Road): From SR 1534 to Swain County.
- SR 1416 (Shoal Creek Road): From SR 1531 (Old US 19A) to 1.89 miles E of SR 1531.
- SR 1424 (Olivet Church): From US 441 to SR 1427 (Olivet Loop Rd).
- SR 1427 (Olivet Loop Road): From SR 1424 to US 19.

Several additional projects have been recommended to decrease accidents at intersections and to increase traffic safety. These suggestions are based on total number of accidents (reported between 1/90 and 5/93), county planning input, and field investigations. It should be noted that each of the following projects require an additional investigation. A contact representative is listed for each project.

- An investigation involving the intersection of SR 1001 (Speedwell Road) and NC 107 should be conducted by the Traffic Engineering Branch (NCDOT) if future capacity improvements are made to US 107. Progression of traffic at this signalized intersection will be impeded when the adjacent elementary school (K --> 8) opens. The additional vehicles accessing the school may create additional delay or spillback problems for vehicles being processed at the intersection. Bus access and additional turning lanes should be the focus of the analysis if this problem occurs.
- The District Engineer should give all major classified facilities higher priority for shoulder improvements. Adequate shoulder width can improve safety by providing proper roadside recovery distance and a clear zone. It should be noted that in some cases the geographical constraints with terrain may not allow additional improvements to shoulders.

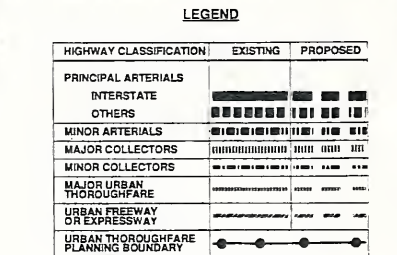
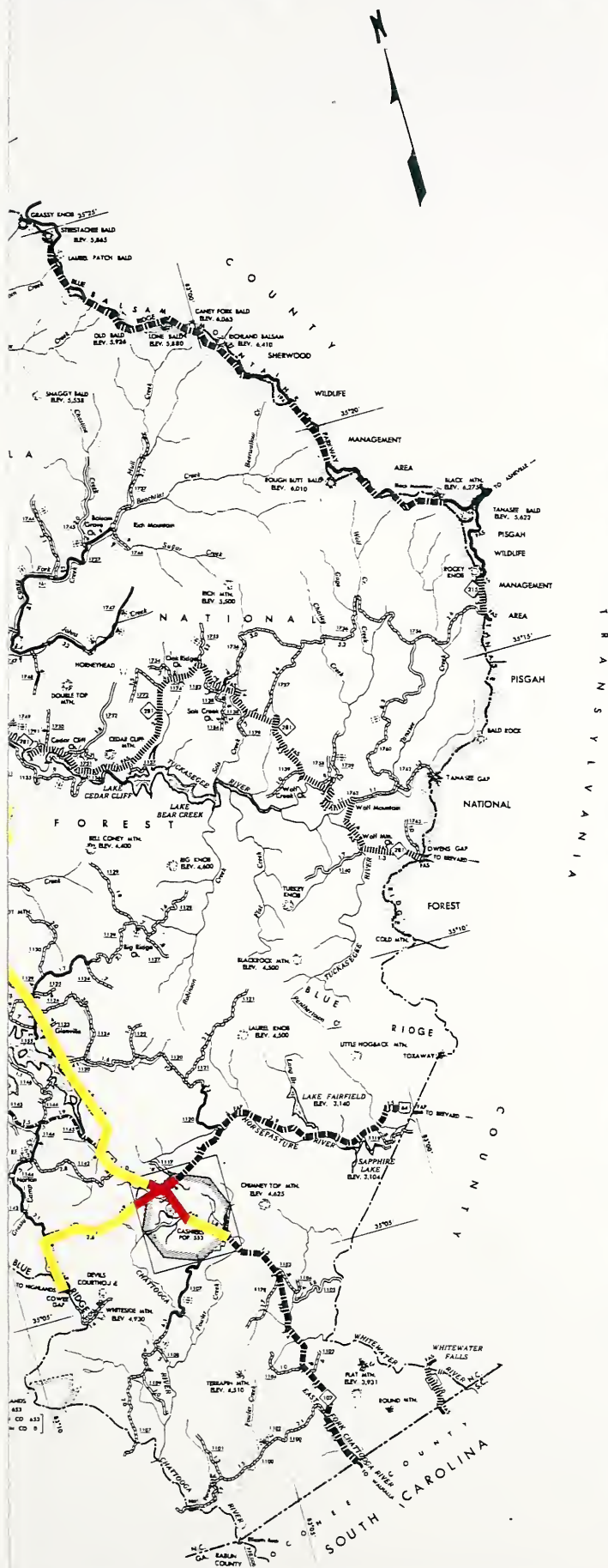
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Several additional projects have been recommended to decrease accidents at intersections and to increase traffic safety. These suggestions are based on total number of accidents (reported between 1/90 and 5/93), county planning input, and field investigations. It should be noted that each of the following projects require an additional investigation. A contact representative is listed for each project.

- An investigation involving the intersection of SR 1001 (Speedwell Road) and NC 107 should be conducted by the Traffic Engineering Branch (NCDOT) if future capacity improvements are made to US 107. Progression of traffic at this signalized intersection will be impeded when the adjacent elementary school (k --> 8) opens. The additional vehicles accessing the school may create additional delay or spillback problems for vehicles being processed at the intersection. Bus access and additional turning lanes should be the focus of the analysis if this problem occurs.
- The District Engineer should give all major classified facilities higher priority for shoulder improvements. Adequate shoulder width can improve safety by providing proper roadside recovery distance and a clear zone. It should be noted that in some cases the geographical constraints with terrain may not allow additional improvements to shoulders.



CONSTRUCTION PLAN

FIGURE 8

ADOPTED BY:
JACKSON COUNTY _____

RECOMMENDED FOR APPROVAL BY:
STATEWIDE PLANNING BRANCH _____

ADOPTED BY:
DEPT. OF TRANSPORTATION _____

PUBLIC HEARING: _____

PUBLIC MEETING: _____

RECOMMENDED THOROUGHFARE PLAN JACKSON COUNTY

NORTH CAROLINA

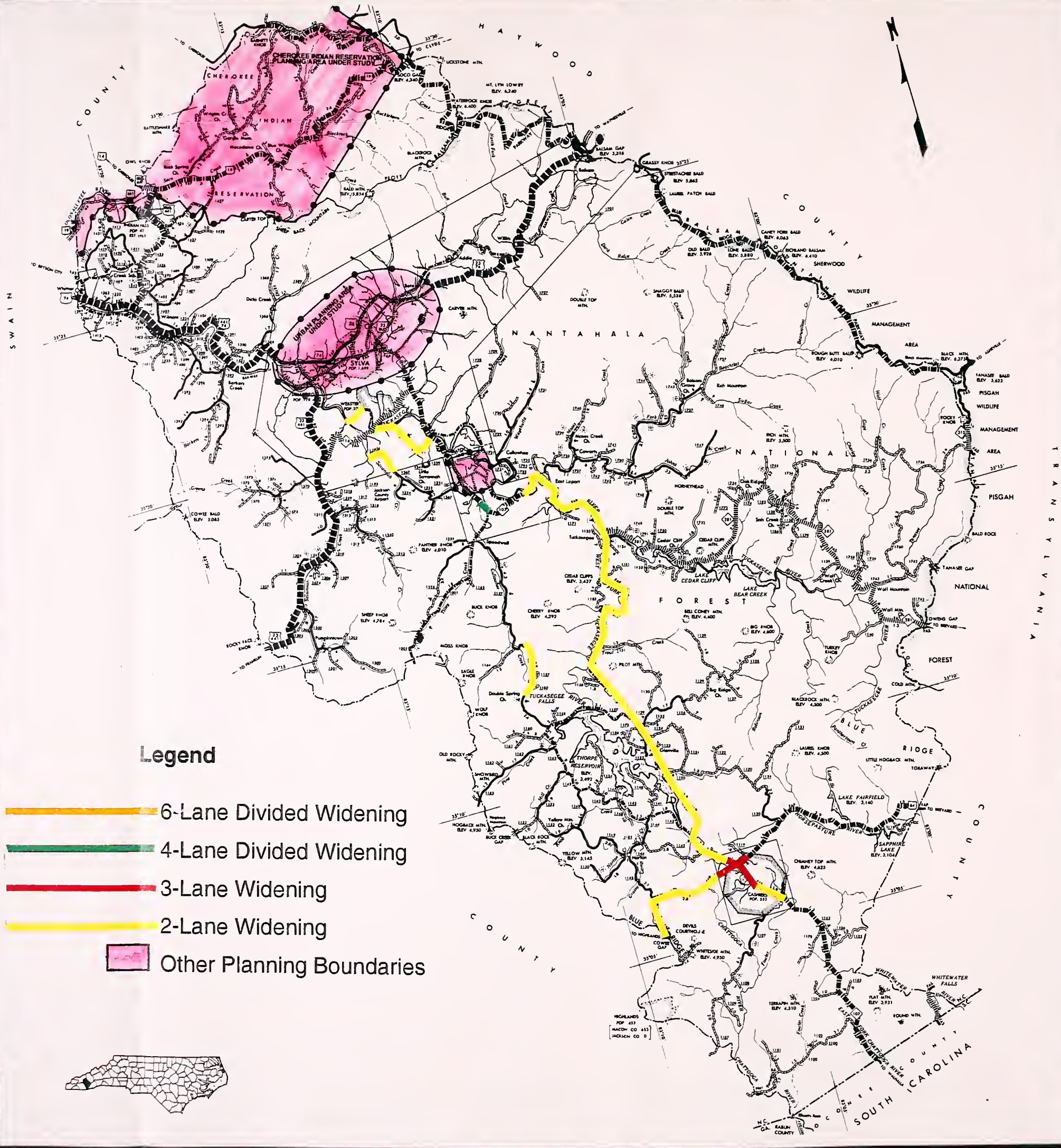
PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-STATEWIDE PLANNING BRANCH

IN COOPERATION WITH
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

JUNE 17, 1993



BASE: 1993



Legend

- 6-Lane Divided Widening
- 4-Lane Divided Widening
- 3-Lane Widening
- 2-Lane Widening
- Other Planning Boundaries

LEGEND

LEGEND

HIGHWAY CLASSIFICATION	EXISTING	PROPOSED
PRINCIPAL ARTERIALS		
INTERSTATE		
OTHERS		
MINOR ARTERIALS		
MAJOR COLLECTORS		
MINOR COLLECTORS		
MAJOR URBAN THOROUGHFARE		
URBAN FREEWAY OR EXPRESSWAY		
URBAN THOROUGHFARE PLANNING BOUNDARY		

CONSTRUCTION PLAN

FIGURE 8

ADOPTED BY: _____
 JACKSON COUNTY

RECOMMENDED FOR APPROVAL BY: _____
 STATEWIDE PLANNING BRANCH

ADOPTED BY: _____
 DEPT. OF TRANSPORTATION

PUBLIC HEARING: _____

PUBLIC MEETING: _____

RECOMMENDED THOROUGHFARE PLAN

JACKSON COUNTY

NORTH CAROLINA

PREPARED BY THE
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS-STATEWIDE PLANNING BRANCH

IN COOPERATION WITH
 U.S. DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION

JUNE 17, 1993

SCALE

SCALE FOR ENLARGEMENTS

BASE: 1993

BICYCLE SECTION

This section of the report is dedicated solely to addressing the bicycle needs of Jackson County.

In a letter dated March 1992, the Jackson County Planning Board prepared a priority list of their transportation concerns for the County. The letter listed provisions for bicycles as a high priority. To date, the only designated bicycle route in Jackson County consist of the red highlighted facilities in **Figure 9**. This route is part of the Mountains to Sea route and is designated as NC Bike Route 2. This means that these facilities may be subject to more bicycle traffic than other facilities of similar design. If a facility is designated and signed as a bike route, then the minimum design standards for these facilities should be met. Due to the shared, or multi-modal, use of these facilities, it is recommended that the sub-standard bicycle routes be widened to a standard 24 foot cross-section. This widening will enhance safety and improve the functional design of the facility.

The following facilities are part of the designated Mountains to Sea Bike Route with sub-standard widths. It is recommended that these facilities be widened to 24'-standards with an additional 2 feet of paved shoulders for bicycles.

- SR 1001 (Speedwell Road): From NC 107 to Macon County.
- SR 1449 (Cope Creek Road): From SR 1527 (Scott's Creek) to NC 107.

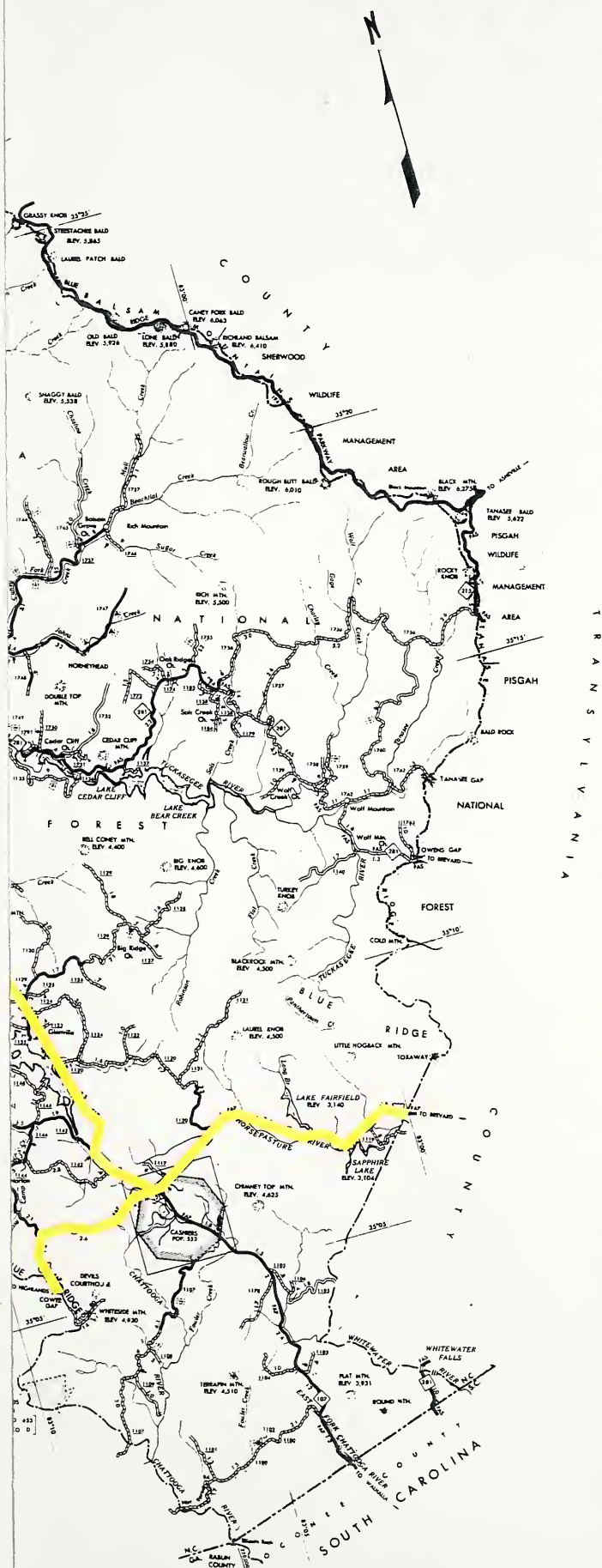
In addition, **Figure 9** highlights facilities in yellow within the county that would provide a continuous and comprehensive bicycle system for Jackson County. The system utilizes NC 107, US 64, US 441, and US 74. This system provides access to the northern and southern developed areas of Jackson County, as well as a connection to adjacent counties.

The system includes three facilities that would require additional improvements to bring them up to 24'-standards with additional 2 feet of paved shoulders for bicycles. They are:

- NC 116: From US 23/441 to NC 107.
- SR 1002: From NC 107 to NC 107 (East Laport).
- SR 1732 (Weyehutta Road): From SR 1002 to SR 1002 (Cullowhee).

When considering the widening of these facilities, it is recommended that the Office of Bicycle and Pedestrian Transportation (NCDOT) be consulted. They can help provide the most appropriate cross-section for the widening. They may also provide assistance in identifying the need for bicycle improvements based on present and future bicycle traffic. The County should contact the coordinator of this branch for further consideration and assistance.

Bicycle and Pedestrian Program
NC Department of Transportation
P. O. Box 25201
Raleigh, NC 27611



LEGEND

	PRIMITIVE OR UNIMPROVED ROAD		COUNTY OR MUNICIPAL AIRPORT
	GRADED AND DRAINED ROAD		RAILROAD RIGHT-OF-WAY
	SOIL, GRAVEL, OR STONE SURFACED ROAD		NARROW GAUGE RAILROAD
	HARD SURFACED ROAD		LIGHTHOUSE
	4 LANE UNDIVIDED HIGHWAY		COAST GUARD STATION
	DIVIDED HIGHWAY		CANAL
	HIGHWAY WITH FRONTAGE ROADS		NARROW STREAM
	FULL CONTROL ACCESS		WIDE STREAM
	FEDERAL AID INTERSTATE ROAD		DAM WITH LOCK
	FEDERAL AID PRIMARY ROAD		RESERVOIR, POND, OR LAKE
	FEDERAL AID SECONDARY ROAD		PROMINENT PEAK, MOUNTAIN, OR ISLAND
	FEDERAL AID URBAN		ROAD THROUGH MOUNTAIN PASS
	HIGH SYSTEM ROAD		HIGHWAY BRIDGE OVER 10 FT
	PROJECTED LOCATION		DRAW SPAN ON BRIDGE
	INTERSECTION DISTANCE		HIGHWAY TUNNEL
	TRAFFIC CIRCLE		FORD
	HIGHWAY INTERCHANGE		STATE LINE
	DETAILED HIGHWAY INTERCHANGE		COUNTY LINE
	INTERSTATE HIGHWAY		CITY LIMIT
	U.S. NUMBERED HIGHWAY		RESERVATION OR PARK BOUNDARY
	U.S. NUMBERED BICYCLE ROUTE		SHORT AREA UNINCORPORATED CENSUS DESIGNATED PLACE
	NC NUMBERED HIGHWAY		COUNTY SEAT
	NC NUMBERED BICYCLE ROUTE		OTHER TOWNS AND VILLAGES
	SECONDARY ROAD NUMBER		TRIANGULATION STATION
	UNDERGROUND CABLE		UNINCORPORATED CITY OR VILLAGE (UNINCORPORATED)
	RAILROAD ANY NUMBER OF TRACKS USED BY SINGLE OPERATING COMPANY		SCHOOL
	RAILROAD ANY NUMBER OF TRACKS USED BY MORE THAN ONE OPERATING COMPANY ON SAME OR ADJACENT RIGHT-OF-WAY		CHURCH
	RAILROAD STATION		CHURCH WITH CEMETERY
	GRADE CROSSING		CEMETERY
	OVERPASS		CORRECTION OF TOTAL HIGH HIGHWAY GARAGE OR MAIN YARD
	RAILROAD TUNNEL		HIGHWAY DIV OR DET. ORANCE
	ARMY, NAVY, OR MARINE CORPS FIELD		WEIGHT STATION
			PARKING STATION
			BEST AREA
			MONUMENT - SMALL HISTORICAL SITE

BICYCLE ROUTE SYSTEM

LEGEND

	MOUNTAINS TO SEA BICYCLE ROUTE
	PROPOSED BICYCLE ROUTE
	URBAN PLANNING BOUNDARY

FIGURE 9
JACKSON COUNTY

NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-STATEWIDE PLANNING BRANCH

IN COOPERATION WITH
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION





BICYCLE ROUTE SYSTEM

LEGEND

- MOUNTAINS TO SEA BICYCLE ROUTE
- PROPOSED BICYCLE ROUTE
- URBAN PLANNING BOUNDARY

FIGURE 9

JACKSON COUNTY

NORTH CAROLINA

PREPARED BY THE

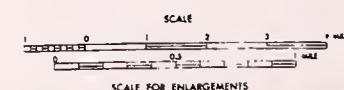
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS-STATEWIDE PLANNING BRANCH

IN COOPERATION WITH

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION



BASE: 1993

CONSTRUCTION PRIORITIES AND COST ESTIMATES

The improvements to the Jackson County Thoroughfare Plan obviously cannot be undertaken all at once, nor should they be. The cost would be overwhelming and the need for many of the improvements is not immediate. In an effort to reflect the relative value of various improvements, an assessment has been made of the benefits that can be expected from each project and a comparison has been made to the projected costs involved. The result of this benefit-cost analysis is the development of a listing of priorities for those recommended improvements.

Priorities have been set by comparing the benefits that will result to the expected project costs. Three principal measures of benefits were used: road user cost savings, the potential for increased economic development resulting from the improvement, and the environmental impact, both positive or negative, which might result. The first measure is an actual estimate of dollar savings, while the others are estimates of the probability of the resulting change.

Reduced road user costs should result from any roadway improvement, from a simple widening to the construction of a new roadway to relieve congested or unsafe conditions. Comparisons of the existing and the proposed facility have been made in terms of vehicle operating costs, travel time costs, and accident costs. These user benefits are computed as total dollar savings over the 23 year design period using data such as project length, base year and design year traffic volumes, traffic speed, type of facility, and volume/capacity ratio.

The impact of a project on economic development potential is denoted as the probability that it will stimulate the economic development of an area by providing access to developable land and reducing transportation costs. It is a subjective estimate based on the knowledge of the proposed project, local development characteristics, and land development potential. The probability is rated on a scale from 0 (none) to 1.00 (excellent).

The environmental impact analysis considers the effect of a project on the physical, social/cultural, and economic environment. **Table 10** lists the items that are considered when evaluating the impact on the environment. Many of these have been accounted for in evaluating the project with respect to user benefits, cost, and economic development potential. However, thirteen environmental factors are generally not considered in these evaluations. They are the environmental impacts of a project on: (1) air quality, (2) water resources, (3) soils and geology, (4) wildlife, (5) vegetation, (6) neighborhoods, (7) noise, (8) educational facilities, (9) churches, (10) parks and recreational facilities, (11) historic sites and landmarks, and (12) public health and safety. The summation of both positive and negative impact probabilities with respect to these factors provides a measure of the relative environmental impact of a project.

Table 10

Environmental Considerations

Physical Environment

Air quality
Water Resources
Soils and Geology
Wildlife
Vegetation

Social and Cultural Environment

Housing
Neighborhoods
Noise
Educational Facilities
Churches
Parks and Recreational Facilities
Public Health and Safety
National Defense
Aesthetics

Economic Environment

Businesses
Employment
Economic Development
Public Utilities
Transportation Costs
Capital Costs
Operation and Maintenance Costs

Offsetting the benefits that would be derived from any project is the cost of its construction. A new facility, despite its high projected benefits, might prove to be unjustified due to the excessive costs involved in construction. The highway costs estimated in this report are based on the average statewide construction costs for similar project types. An estimate of anticipated right-of-way costs is also included.

Recommended priorities for construction and their estimated costs (in 1992 dollars) are listed in Appendix A, Table A1. Cost estimates for widening of roads to bring them up to AASHTO design standards (Table 8) are also given in Table A1. Priorities for these improvements should be continually monitored by the County and the Division Engineer so that as additional funds become available, they can be implemented.

VI. IMPLEMENTATION

There are several tools available for use by the County to assist in the implementation of a thoroughfare plan. They are as follows:

State-County Adoption of Thoroughfare Plan

As shown in **Figure 7**, the North Carolina Department of Transportation, in cooperation with Jackson County, has developed a revised County Thoroughfare Plan. The plan serves as a guide to the Department of Transportation in the development of the highway system for the County. The approval of the plan by the County will enable standard road regulations and land use controls to be used effectively in the implementation of this plan.

Watershed Protection Controls

The watershed protection regulations require that all development of property in the watershed must comply with the provisions of the Jackson County Watershed Protection Ordinance. Where possible, roads should be located outside of critical areas and watershed buffer areas. Roads constructed within these areas shall be designed and constructed so to minimize their impact on water quality.

Funding

The majority of the improvements are scheduled and funded by the Transportation Improvement Program. The Board of Transportation regularly conducts public meetings to obtain input from the public pertaining to their needs for highway improvements.

Not all roadway improvements are covered by this procedure. Nearly all secondary road work is done on a county by county basis. These funds, known as the county construction account, are used to pave unimproved roads, widen roadways, stabilize dirt roads, make minor alignment improvements, and even construct short connectors when appropriate. The County Commissioners are encouraged to work with the Division Engineer when the County's priority list is developed. Many of the minor improvements recommended may be realized by using the County's construction account funds and developing the County's priority list in conjunction with the Division Engineer.

APPENDIX A

Typical Cross Sections

Typical cross sections recommended by the Thoroughfare Planning Unit are shown in Figure A1, and listed in Table A1.

Cross section "A" is illustrative for controlled access freeways. The 46 foot grassed median is the minimum median width. Wider variations could result depending upon design considerations. Slopes of 8:1 into 3 foot drainage ditches are desirable for traffic safety. Right-of-way requirements would typically vary upward from 250 feet depending upon cut and fill requirements.

Cross section "B" is typical for four lane divided highways in rural areas which may have only partial or no control of access. The minimum median width for this cross section is 30 feet, but a wider median is desirable. Design requirements for slopes and drainage would be similar to cross section "A", but there may be some variation from this depending upon right-of-way constraints.

Cross section "C", seven lane urban, and cross section "D", five lane urban, are typical for major thoroughfares where frequent left turns are anticipated as a result of abutting development or frequent street intersections.

Cross sections "E" and "F" are used on major thoroughfares where left turns and intersecting streets are not as frequent. Left turns would be restricted to a few selected intersections.

Cross section "G" is recommended for urban boulevards or parkways to enhance the urban environment and to improve the compatibility of major thoroughfares with residential areas. A minimum median width of 24 feet is recommended with 30 feet being desirable.

Typical cross section "H" is recommended for major thoroughfares where projected travel indicates a need for four travel lanes, but traffic is not excessively high, left turning movements are light, and right-of-way is restricted. An additional left turn lane probably would be required at major intersections.

Thoroughfares which are proposed to function as one-way traffic carriers would typically require cross section "I". Cross section "J" and "K" are usually recommended for minor thoroughfares since these facilities usually serve both land service and traffic service functions. Cross section "J" would be used on those minor thoroughfares where parking on both sides is needed as a result of more concentrated development.

Cross section "L" is used in rural areas or for staged construction of a wider multilane cross section. On some thoroughfares projected traffic volumes may indicate that two travel lanes will adequately serve travel for a considerable period of time.

The curb and gutter cross sections all illustrate the sidewalk adjacent to the curb with a buffer or utility strip between the sidewalk and the minimum right-of-way line. This permits adequate setback for utility poles. If it is desired to move the sidewalk further away from the street to provide added separation for pedestrians or for aesthetic reasons, additional right-of-way must be provided to insure adequate setback for utility poles.

Rights-of-way shown for the typical cross sections are the minimum rights-of-way required to contain the street, sidewalks, utilities, and drainage facilities. Cut and fill requirements may require either additional right-of-way or construction easements. Obtaining construction easements is becoming the more common practice for urban thoroughfare construction.

If there is sufficient bicycle traffic along the thoroughfare to justify a bicycle lane or bikeway, additional right-of-way may be required to allow for the bicycle facilities. The North Carolina Bicycle Facility and Program Handbook should be consulted for design standards for bicycle facilities.

Recommended typical cross sections for thoroughfares were derived on the basis of projected traffic, existing capacities, desirable levels of service and available right-of-way.

Capacity Analysis

A good indication of the adequacy of the existing major street system is a comparison of the traffic volumes with the ability of the streets to move traffic freely at a desirable speed. The ability of a street to move traffic freely, safely, and efficiently with a minimum delay is controlled principally by the spacing of major devices utilized. Thus, the ability of a street to move traffic can be increased by restricting parking and turning movements, using proper sign and signal devices, and by the application of other traffic engineering techniques.

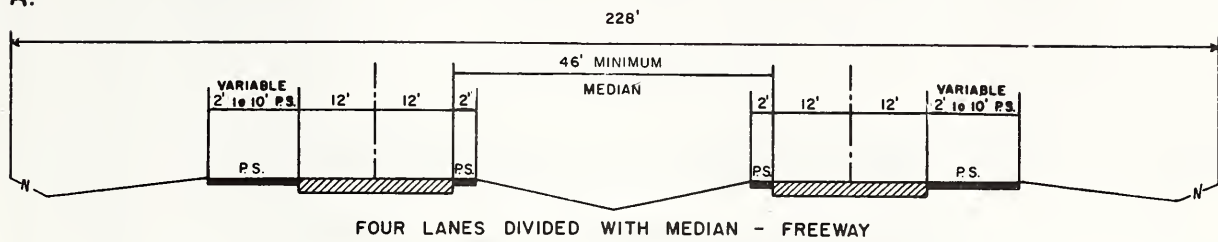
Capacity is defined as the maximum number of vehicles that have a reasonable expectation of passing over a given section of a roadway in one direction, or in both directions, during a given period under prevailing roadway and traffic conditions.¹ The relationship of traffic volumes to the capacity of the roadway will determine the **level of service** being provided. Six levels of service have been selected to identify the conditions existing under various speed and volume conditions on a highway or street.

The six levels of service are illustrated in Figure A2, and they are defined on the following pages. The definitions are general and conceptual in nature, but may be applied to urban arterial levels of service. Levels of service for interrupted flow facilities vary widely in terms of both the user's perception of service quality and the operational variables used to describe them. Each chapter of the 1985 Highway Capacity Manual contains more detailed descriptions of the levels of service as defined for each facility type.

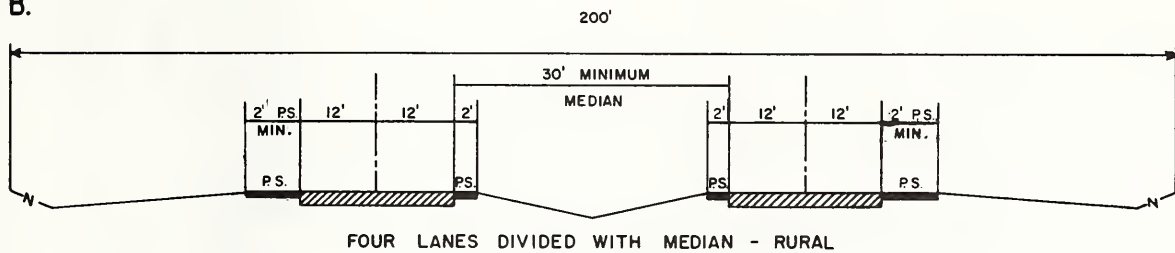
¹ Highway Capacity manual, Special Report 209, 1985, p. 1-3.

TYPICAL THOROUGHFARE CROSS SECTIONS

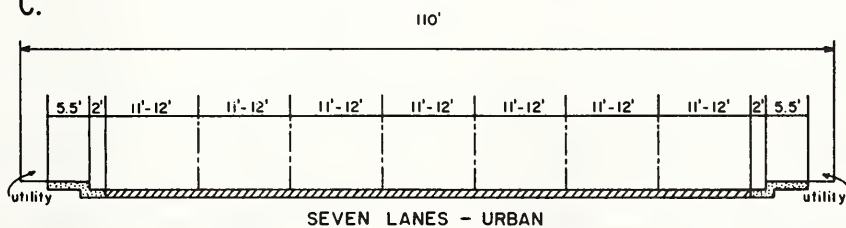
A.



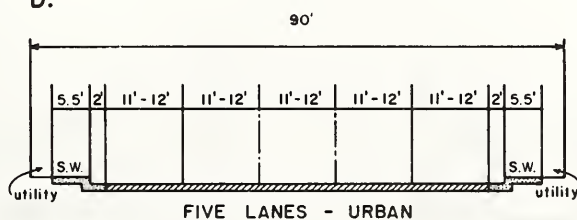
B.



C.



D.



E.

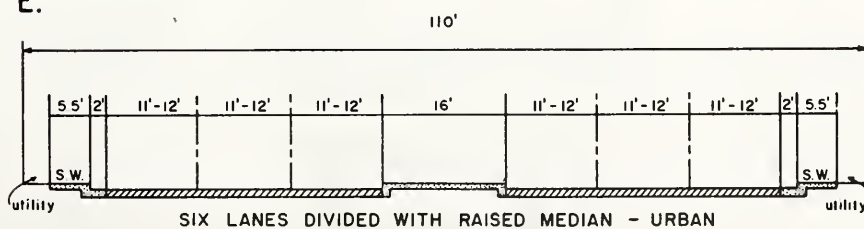
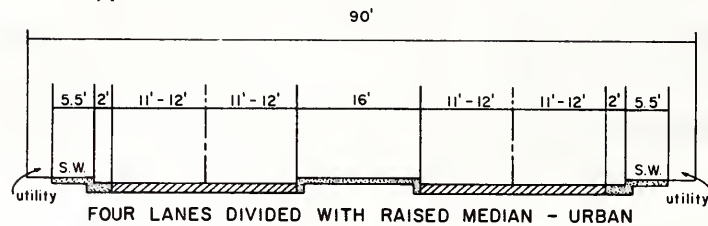


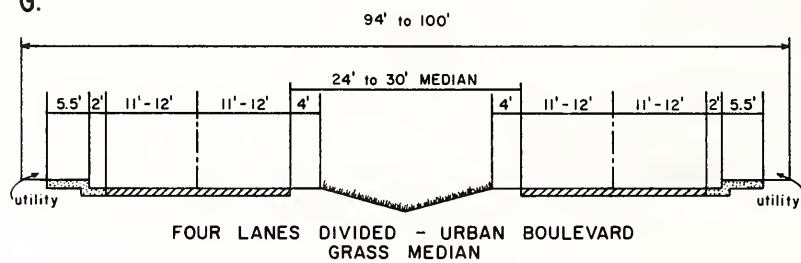
FIGURE A1

TYPICAL THOROUGHFARE CROSS SECTIONS (CONTINUED)

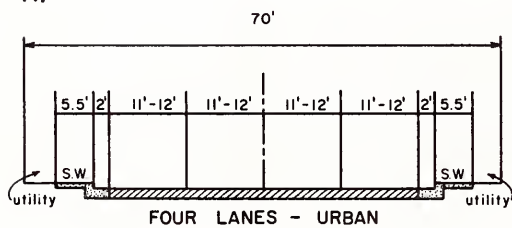
F.



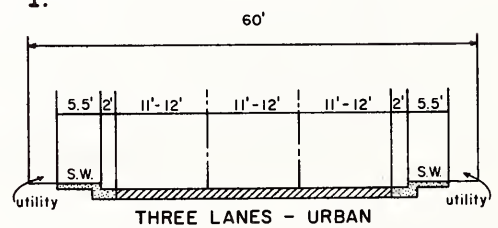
G.



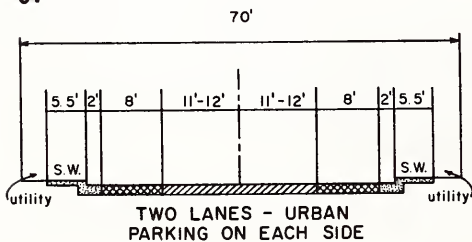
H.



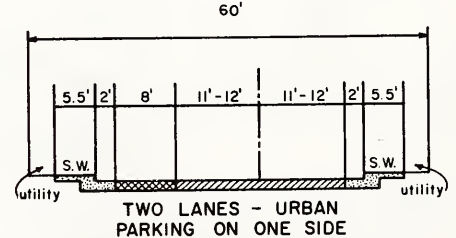
I.



J.



K.



L.

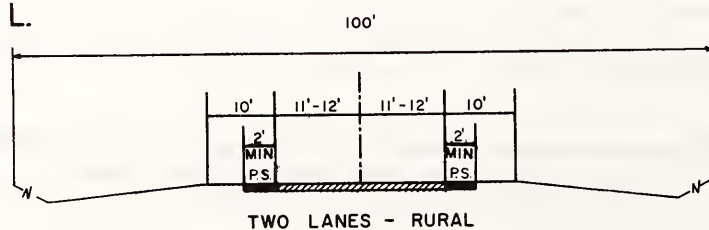


TABLE A1

CONSTRUCTION PRIORITIES AND COST ESTIMATES										ECONOMIC	
RECOMMENDED		LENGTH	COST ESTIMATES (\$1,000)	CONSTRUCTION ROW	TOTAL BENEFITS (\$1,000)	IMPACT PROBABILITY	ENVIRON.	DEVELOPMENT	POTENTIAL		
HIGHWAY SECTION	CROSS SECTION	(miles)									
FIRST PRIORITY:											
NC 107											
1. NC 116-ECL SYLVA	E	1.77	1,770	60	1,830	87,090	+.40	-.30		.60	
NC 107											
SR 1001-.39m N of							+.30				
2. SR 1001	B	0.39	350	25	375	3,490	-.20			.20	
NC 107							+.20				
3. SR 1112-SR 1141	I	0.88	616	N/A	616	14,780	-.00			.25	
US 64							+.20				
4. SR 1141-SR 1116	I	1.00	700	N/A	700	16,820	-.00			.25	
SECOND PRIORITY:											
NC 116							+.20				
5. SR 1359-SR 1509	L	1.30	520	N/A	520	8,810	-.00			.20	
NC 107											
-SCL CASHIERS-SR 1112	L	1.19					+.20				
6. -SR 1141-NC 281	L	14.32	6,200	N/A	6,200	35,960	-.00			.20	
NC 107											
-NC 281-2.96m N of											
NC 281	L	2.96									
-3.3m N of NC 281-											
7. 3.63m N of NC 281	L	0.33	1,150	N/A	1,150	1,970	+.20	-.00		.20	

TABLE A1 (continued)
CONSTRUCTION PRIORITIES AND COST ESTIMATES

HIGHWAY SECTION	RECOMMENDED CROSS SECTION	LENGTH (miles)	COST ESTIMATES (\$1,000)	CONSTRUCTION ROW TOTAL	(\$1,000) BENEFITS PROBABILITY	ENVIRON. IMPACT	ECONOMIC DEVELOPMENT POTENTIAL
NC 116							
US 23-2.18m E of							
8. US 23	L	2.18	870	N/A	870	2,140	.20
US 64							
9. MACON CO-SR 1141	L	3.90	1,560	N/A	1,560	3,340	.20
THIRD PRIORITY:							
SR 1340							
.22m S of NC 116-							
10. 2.33m S of NC 116	L-22'	2.11	800	46	846	472	.14

1. **Level-of-service A** describes primarily free flow operations at average travel speeds, usually about 90 percent of the free flow speed for the arterial class. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Stopped delay at signalized intersections is minimal.
2. **Level-of-service B** represents reasonable unimpeded operations at average travel speeds, usually about 70 percent of the free flow speed for the arterial class. The ability to maneuver within the traffic stream is only slightly restricted and stopped delays are not bothersome. Drivers are not generally subjected to appreciable tension.
3. **Level-of-service C** represents stable operations. However, ability to maneuver and change lanes in midblock locations may be more restricted than in LOS B, and longer queues and/or adverse signal coordinations may contribute to lower average travel speeds of about 50 percent of the average free flow speed for the arterial class. Motorists will experience an appreciable tension while driving.
4. **Level-of-service D** borders on a range on which small increases in flow may cause substantial increases in approach delay and, hence, decreases in arterial speed. They may be due to adverse signal progression, inappropriate signal timing, high volumes, or some combination of these. Average travel speeds are about 40 percent of free flow speed.
5. **Level-of-service E** is characterized by significant approach delays and average travel speeds of one-third the free flow speed or lower. Such operations are caused by some combination of adverse progression, high signal density, extensive queuing at critical intersections, and inappropriate signal timing.
6. **Level-of-service F** characterizes arterial flow at extremely low speeds below one-third to one-quarter of the free flow speed. Intersection congestion is likely at critical signalized locations, with high approach delays resulting. Adverse progression is frequently a contributor to this condition.



LEVEL OF SERVICE - A



LEVEL OF SERVICE - B



LEVEL OF SERVICE - C



LEVEL OF SERVICE - D



LEVEL OF SERVICE - E



LEVEL OF SERVICE - F

LEVELS OF SERVICE

FIGURE A2



APPENDIX B

APPENDIX B

TABLE B1 - THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

JACKSON COUNTY FACILITY AND SECTION	DIST (MI)	RDWAY (FT)	ROW (FT)	PRACTICAL CAPACITY (VPD)	1992 ADT	2015 ADT	RDWAY (ULT)	ROW (ULT)
23:								
ACON CO - 1.35m N OF			250-					
NC 116	8.30	48	360	50,000	8,500	16,800	ADQ	ADQ
.35m N OF NC 116 -								
2.38m N OF NC 116	1.03	48	200	37,100	9,200	16,800	ADQ	ADQ
ILLSBORO-----								
YLVA-----								
.65m E OF US 23 BUS -			150-					
HAYWOOD COUNTY	6.82	48	260	50,000	12,900	22,750	ADQ	ADQ
64:								
ACON COUNTY - SR 1141	3.90	18	60	9,000	2,700	5,950	24	ADQ
R 1141 - NC 107	0.75	18	60	8,000	3,900	9,600	36	ADQ
C 107 - SR 1116	0.25	18	60	8,000	7,200	12,700	36	ADQ
R 1116 - 4.17m N OF								
SR 1116	4.17	18	60	9,000	2,400	5,900	TIP	TIP
.17m N SR 1116 -								
TRANSYL COUNTY	2.90	20	60	11,000	2,400	5,900	TIP	TIP
74:								
WAIN COUNTY - US 441	1.76	48	360	50,000	10,900	22,490	ADQ	ADQ
S 441 - 1.23m S OF								
US 441	1.23	48	150	48,000	10,900	22,400	ADQ	ADQ
.23m S OF US 441 -								
6.74m S OF US 441	5.51	48	220	50,000	13,000	30,300	ADQ	ADQ
ILLSBORO-----								
441 BUSINESS:								
S 441 - US 19	0.82	48	200	33,500	----	----	ADQ	ADQ
441:								
COMMON W/ US 23	10.30							
COMMON W/ US 74	7.61							
S 74 - US 441 BUS.	3.69	64	100	33,500	6,000	11,800	ADQ	ADQ

PRACTICAL CAPACITY defined as the Level of Service as set for the speed conditions used in Table 8.

VPD - Vehicles per Day; ADT - Average Daily Traffic; ULT - Ultimate
ROW - Right of Way; ADQ - Adequate; TIP - Transportation Improvement Program

APPENDIX B

TABLE B2 - THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

JACKSON COUNTY FACILITY AND SECTION	DIST (MI)	RDWAY (FT)	ROW (FT)	PRACTICAL CAPACITY (VPD)	1992 ADT	2015 ADT	RDWAY (ULT)	ROW (ULT)
NC 107:								
SOUTH CAROLINA -								
SCL CASHIERS	6.53	18	60	8,000	1,200	2,650	ADQ	ADQ
SCL CASHIERS - SR 1112	1.19	18	60	8,000	3,700	7,100	24	ADQ
SR 1112 - US 64	0.58	18	60	8,000	4,900	11,200	36	100
US 64 - SR 1141	0.30	18	60	8,000	5,500	12,150	36	100
SR 1141 - NC 281	14.32	18	60	8,500	3,600	7,100	24	ADQ
NC 281 - 2.96m N OF								
NC 281	2.96	20	60	11,000	1,200	2,400	24	ADQ
2.96m N OF NC 281 -								
3.3m N OF NC 281	0.34	24	60	13,000	3,000	6,200	ADQ	ADQ
3.3m N OF NC 281 -								
3.63m N OF NC 281	0.33	20	60	11,000	3,000	6,200	24	ADQ
3.63m N OF NC 281 -								
SR 1001	1.81	24	100	13,000	3,000	6,200	ADQ	ADQ
SR 1001 - .39m N OF								
SR 1001	0.39	24	100	13,000	6,600	13,000	48(B)	200
.39m N OF SR 1001 -								
SR 1330	0.28	48	100	50,000	6,600	13,000	ADQ	ADQ
SR 1330 - 4.03m N OF			160-					
SR 1330	4.03	48	300	50,000	15,400	34,000	ADQ	ADQ
4.03m N OF SR 1330 -								
NC 116	0.14	64	100	39,400	19,600	38,700	72(E)	110
NC 116 - SYLVA PLAN.	1.63	52	80	37,100	22,800	40,250	72(E)	110
BOUNDARY								
NC 116:								
US 23 - .85m E OF								
US 23	0.85	20	60	9,500	2,500	4,400	24	ADQ
.85m E OF US 23 -								
2.18m E OF US 23	1.33	20	100	9,500	2,700	4,750	24	ADQ
2.18m E OF US 23 -								
SR 1359	0.29	22	100	11,500	3,500	6,900	ADQ	ADQ
SR 1359 - SR 1509	1.30	20/22	100	9,500	4,400	10,000	ADQ	ADQ
SR 1509 - NC 107	0.47	36	100	21,400	7,600	16,800	ADQ	ADQ
NC 215:								
TRANSYL CO - TRANS CO	0.53	20	60	11,000	150	2,000	ADQ	ADQ
NC 281:								
NC 107 - SR 1756	8.38	20	100	11,000	470	1,050	ADQ	ADQ
SR 1756 - TRANSYL CO	4.99	16	60	7,000	160	600	TIP	TIP
TRANSYLVANIA COUNTY--								
TRANS CO - TRANS CO	1.00	20	120	11,000	200	1,000	ADQ	ADQ

PRACTICAL CAPACITY defined as the Level of Service as set for the speed conditions used in Table 8.

VPD - Vehicles per Day; ADT - Average Daily Traffic; ULT - Ultimate

ROW - Right of Way; ADQ - Adequate; TIP - Transportation Improvement Program

APPENDIX B

TABLE B3 - THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

JACKSON COUNTY FACILITY AND SECTION	DIST (MI)	RDWAY (FT)	ROW (FT)	PRACTICAL CAPACITY (VPD)	1992 ADT	2015 ADT	RDWAY (ULT)	ROW (ULT)
UE RIDGE PARKWAY: (FEDERAL HIGHWAY)	N/A							
1001: C 107 - MACON COUNTY	5.61	18	60	9,000	600	1,150	24	ADQ
1002: C 107 - .2m S NC 107	0.20	48	60	50,000	1,100	2,700	ADQ	ADQ
.2m S NC 107 - 3.16m S OF NC 107	2.96	24	100	13,000	1,050	2,150	ADQ	ADQ
.16m S OF NC 107 - SR 1792	2.58	20	60	11,000	1,000	2,150	24	ADQ
R 1792 - NC 107	0.10	24	60	13,000	1,050	2,300	ADQ	ADQ
1145: R 1157 - NC 107	7.90	18	60	9,000	470	900	ADQ	ADQ
1157: R 1145 - NC 107	3.30	18	N/A	9,000	400	1,050	ADQ	ADQ
1340: C 116 - .22m S NC 116	0.22	22	70	12,000	1,050	2,120	ADQ	ADQ
.22m S OF NC 116 - 2.33m S OF NC 116	2.11	16	N/A	8,000	1,050	2,120	22	60
.33m S OF NC 116 - NC 107	0.11	24	60	13,000	1,050	2,120	ADQ	ADQ
1397: WAIN CO - SR 1534	3.80	18	60	9,000	390	1,200	ADQ	ADQ
1416: R 1531 - 1.89m E OF SR 1531	1.89	16	N/A	8,000	360	1,000	ADQ	ADQ
.89m E OF SR 1531 - US 441	0.29	20	60	11,000	360	1,000	ADQ	ADQ
1424: S 441 - .08m N US 441	0.08	20	60	11,000	820	1,800	ADQ	ADQ
.08m N OF US 441 - SR 1427	1.55	18	60	9,000	820	1,800	ADQ	ADQ
1427: R 1424 - US 19	1.10	18	N/A	9,000	1,040	2,150	ADQ	ADQ

PRACTICAL CAPACITY defined as the Level of Service as set for the speed conditions used in Table 8.
 VPD - Vehicles per Day; ADT - Average Daily Traffic; ULT - Ultimate
 ROW - Right of Way; ADQ - Adequate; TIP - Transportation Improvement Program

APPENDIX B

TABLE B4 - THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

JACKSON COUNTY FACILITY AND SECTION	DIST (MI)	RDWAY (FT)	ROW (FT)	PRACTICAL CAPACITY (VPD)	1992 ADT	2015 ADT	RDWAY (ULT)	ROW (ULT)
SR 1432:								
.20m E OF SR 1498 -								
2.83m E OF SR 1498	2.63	20	100	11,000	2,680	5,300	ADQ	ADQ
2.83m E OF SR 1498 -								
US 23	0.11	20	60	11,000	550	1,350	ADQ	ADQ
SR 1531:								
SR 1416 - .2m S OF								
SR 1416	0.20	20	60	10,500	2,300	4,750	ADQ	ADQ
.2m S OF SR 1416 -								
US 74	0.28	46	150	13,000	2,300	4,750	ADQ	ADQ
SR 1534:								
SR 1397 - US 74	0.10	20	60	11,000	390	1,200	ADQ	ADQ
SR 1157: (UNPAVED)								
(NON-CLASSIFIED FAC.)								
4.5m S OF SR 1001 -								
6.8m S OF SR 1001	2.30	16	60	8,000	100	500	20	ADQ
SR 1359: (UNPAVED)								
(NON-CLASSIFIED FAC.)								
SR 1361 - UNPAVED SECT	2.62	18	50	9,000	500	1,000	22	ADQ
UNPAVED SECT -----	0.30	16	N/A	8,000	500	1,000	22	60
UNPAVED SECT - NC 116	0.54	18	N/A	9,000	500	1,000	22	60
SR 1367: (UNPAVED)								
(NON-CLASSIFIED FAC.)								
.2m S OF SR 1321 -								
1.18m S OF SR 1321	0.98	10	60	N/A	80	400	20	ADQ

PRACTICAL CAPACITY defined as the Level of Service as set for the speed conditions used in Table 8.

VPD - Vehicles per Day; ADT - Average Daily Traffic; ULT - Ultimate

ROW - Right of Way; ADQ - Adequate; TIP - Transportation Improvement Program

APPENDIX C

TABLE C1**JACKSON COUNTY VEHICLE REGISTRATION**

<u>YEAR</u>	<u>VEHICLES REGISTERED</u>	<u>POPULATION</u>	<u>PERSONS PER VEHICLE</u>
1940	1,650	19,366	11.74
1950	3,364	19,261	5.73
1960	5,682	17,780	3.13
1970	9,303	21,593	2.32
1980	16,779	25,811	1.54
1990	21,527	26,846	1.25
*2000	25,598	27,534	1.08
*2010	30,537	28,208	0.92

TABLE C2**NORTH CAROLINA VEHICLE REGISTRATION**

<u>YEAR</u>	<u>VEHICLES REGISTERED</u>	<u>POPULATION</u>	<u>PERSONS PER VEHICLE</u>
1940	647,242	3,571,623	5.52
1950	1,147,233	4,061,929	3.54
1960	1,704,203	4,556,155	2.67
1970	2,742,673	5,084,411	1.85
1980	3,896,544	5,880,095	1.51
1990	4,962,268	6,628,637	1.34
*2000	6,851,590	7,399,683	1.08
*2010	8,235,600	8,070,889	0.98

* Projected statistics supplied by North Carolina State Data Center and North Carolina Department of Motor Vehicles.

APPENDIX D

APPENDIX D

RECOMMENDED SUBDIVISION ORDINANCES Definitions

I. Streets and Roads:

A. Rural Roads

1. Principal Arterial - A rural link in a highway system serving travel, and having characteristics indicative of substantial statewide or interstate travel and existing solely to serve traffic. This network would consist of interstate routes, intrastate routes, and other routes designated as principal arterials.
2. Minor Arterial - A rural roadway joining cities and larger towns and providing intrastate and intercounty service at relatively high overall travel speeds with minimum interference to through movement.
3. Major Collector - A road which serves major intracounty travel corridors and traffic generators and provides access to the arterial system.
4. Minor Collector - A road which provides service to small local communities and traffic generators and provides access to the major collector system.
5. Local Road - A road which serves primarily to provide access to adjacent land, over relatively short distances.

B. Urban Streets

1. Major Thoroughfares - Major thoroughfares consist of interstate, intrastate, other freeway, expressway, or parkway roads, and major streets that provide for the expeditious movement of high volumes of traffic within and through urban areas.
2. Minor Thoroughfares - Minor thoroughfares perform the function of collecting traffic from local access streets and carrying it to the major thoroughfare system. Minor thoroughfares may be used to supplement the major thoroughfare system by facilitating minor through traffic movements and may also serve abutting property.
3. Local Street - A local street is any street not on a higher order urban system and serves primarily to provide direct access to abutting land.

C. Specific Type Rural or Urban Streets

1. Freeway - Divided multilane roadways designed to carry large volumes of traffic at high speeds. A freeway provides for continuous flow of vehicles with no direct access to abutting property and with access to selected crossroads only by way of interchanges. (Design speed 70 mph, Operating speed 55 mph)

2. Secondary Freeway - A divided multilane roadway designed to carry moderate volumes of traffic at moderate speeds. The facility provides for the continuous flow of traffic through full control of access and the provision of interchanges or grade separation with no access at cross roads, and no traffic signals. (Design speed 50-55 mph, Operating speed 40-45 mph)
3. Parkway - A divided multilane roadway designed for non-commercial traffic, with full or partial control of access. Grade separations are provided at major intersections and there are no traffic signals.
4. Expressway - A divided multilane roadway designed to carry heavy volumes of traffic with full or partial control of access. Interchanges are provided at major intersections. There may be access to service roads and local streets, but there will be no signalized intersections.
5. Secondary Expressway - A divided multilane roadway designed to carry moderate volumes of traffic at moderate speeds. This facility may have partial control of access with right turn in and right turn out access to abutting property, and interchanges at major intersections. Some minor intersections may have traffic signal control.
6. Urban Arterial - Multilane roadway with signalized intersections, and access to abutting property. May have grass or barrier type median, or middle left turn lane.
7. Residential Collector Street - A local street which serves as a connector street between local residential streets and the thoroughfare system. Residential collector streets typically collect traffic from 100 to 400 dwelling units.
8. Local Residential Street - Cul-de-sacs, loop streets less than 2,500 feet in length, or streets less than one mile in length that do not connect thoroughfares, or serve major traffic generators, and do not collect traffic from more than 100 dwelling units.
9. Cul-de-sac - A short street having only one end open to traffic and the other end being permanently terminated and a vehicular turn-around provided.
10. Frontage Road - A road that is parallel to a partial or full access controlled facility and provides access to adjacent land.
11. Alley - A strip of land, owned publicly or privately, set aside primarily for vehicular service access to the back side of properties otherwise abutting on a street.

II. Property

- A. Building Setback Line - A line parallel to the street in front of which no structure (ie., residential, or commercial, or industrial building, parking lot) shall be built.
- B. Easement - A grant by the property owner for use by the public, a corporation, or person(s), of a strip of land for a specific purpose.
- C. Lot - A portion of a subdivision, or any other parcel of land, which is intended as a unit for transfer of ownership or for development or both. The word "lot" includes the words "plat" and "parcel".

III. Subdivision

- A. Subdivider - Any person, firm, corporation or official agent thereof, who subdivides or develops any land deemed to be a subdivision.
- B. Subdivision - All divisions of a tract or parcel of land into two or more lots, building sites, or other divisions for the purpose, immediate or future, of sale or building development and all divisions of land involving the dedication of a new street or change in existing streets; provided, however, that the following shall not be included within this definition nor subject to these regulations: (1) the combination of portions of previously platted lots where the total number of lots is not increased and the resultant lots are equal to or exceed the standards contained herein; (2) the division of land into parcels greater than ten acres where no street right-of-way dedication is involved; (3) widening or opening of streets; (4) the division of a tract in single ownership whose entire area is no greater than two acres into not more than three lots, where no street right of way dedication is involved and where the resultant lots are equal to or exceed the standards contained herein.
- C. Dedication - A gift, by the owner, of his property to another party without any consideration being given for the transfer. The dedication is made by written instrument and is completed with an acceptance.
- D. Reservation - Reservation of land does not involve any transfer of property rights. It constitutes an obligation to keep property free from development for a stated period of time.

DESIGN STANDARDS

I. Streets and Roads

The design of all proposed public roads within Pitt County shall be in accordance with the accepted policies of the North Carolina Department of Transportation, Division of Highways, as taken or modified from the American Association of State Highway Officials' (AASHTO) manuals.

The provision of street rights-of-way shall conform and meet the recommendations of the Thoroughfare Plan, as adopted by Pitt County.

The proposed street layout shall be coordinated with the existing street system of the surrounding area. Normally the proposed streets should be the extension of existing streets if possible.

- A. Right-of-way Widths - Right-of-way (ROW) widths shall not be less than the following and shall apply except in those cases where ROW requirements have been specifically set out in the Thoroughfare Plan.

1. Rural	Minimum ROW
a. Principal Arterial	
Freeways	350 ft.
Other	200 ft.
b. Minor Arterial	100 ft.
c. Major Collector	100 ft.
d. Minor Collector	80 ft.
e. Local Road	60 ft. ¹
2. Urban	
a. Major Thoroughfare other than Freeway and Expressway	90 ft.
b. Minor Thoroughfare	70 ft.
c. Local Street	60 ft. ¹
d. Cul-de-sac	Variable ²

The subdivider will only be required to dedicate a maximum of 100 feet of right-of-way. In cases where over 100 feet of right-of-way is desired, the subdivider will be required only to reserve the amount in excess of 100 feet. In all cases in which right-of-way is sought for a fully controlled access facility, the subdivider will only be required to make a reservation. It is strongly recommended that subdivisions provide access to properties from internal streets, and that direct property access to major thoroughfares, principal and minor arterials, and major collectors be avoided. Direct property access to minor thoroughfares is also undesirable.

¹ The desirable minimum right-of-way (ROW) is 60 ft. If curb and gutter is provided, 50 feet of ROW is adequate on local residential streets.

² The ROW dimension will depend on radius used for vehicular turn-around. Distance from edge of pavement of turn-around to ROW should not be less than distance from edge of pavement to ROW on street approaching turn-around.

A partial width right-of-way, not less than sixty feet in width may be dedicated when adjoining undeveloped property that is owned or controlled by the subdivider; provided that the width of a partial dedication be such as to permit the installation of such facilities as may be necessary to serve abutting lots. When the said adjoining property is subdivided, the remainder of the full required right-of-way shall be dedicated.

- B. Street Widths - Widths for street and road classifications other than local streets shall be as recommended by the Thoroughfare Plan. Width of local roads and streets shall be as follows:
1. Local Residential
Curb and Gutter section: 26 feet, face to face of curb
Shoulder section: 20 feet to edge of pavement, 4 foot shoulders
 2. Residential Collector
Curb and Gutter section: 34 feet, face to face of curb
Shoulder section: 20 feet to edge of pavement, 6 foot shoulders
- C. Geometric Characteristics - The standards outlined below shall apply to all subdivision streets proposed for addition to the State Highway System or Municipal Street System. In cases where a subdivision is sought adjacent to a proposed thoroughfare corridor, the requirements of dedication and reservation discussed under Right-of-Way shall apply.
1. Design Speed - The design speed for a roadway should be a minimum of 5 mph greater than the posted speed limit. The design speeds for subdivision type streets are shown on the following page.

DESIGN SPEEDS			
Facility Type	Desirable	Design Speed	
		Level	Minimum Rolling
Rural			
Minor Collector Roads	60	50	40
Local roads including Residential Collectors and Local Residential	50	50*	40*
Urban			
Major Thoroughfares other than Freeways, Expressways, or Parkways	60	50	50
Minor Thoroughfares	60	50	40
Local Streets	40	40**	30**

* Based on projected annual average daily traffic of 400-750. In cases where road will serve a limited area and small number of dwelling units, minimum design speeds can be reduced further.

**Based on projected annual average daily traffic of 50-250.

2. Maximum and Minimum Grades

- a. The maximum grades in percent shall be:

MAXIMUM VERTICAL GRADE		
Design Speed	Terrain	
	Level	Rolling
60	4	5
50	5	6
40	6	7
30		9

- b. Minimum grade should not be less than 0.5%.
- c. Grades for 100 feet each way from intersections (measured from edge of pavement) should not exceed 5%.
- d. For streets and roads with projected annual average daily traffic less than 250, short grades less than 500 feet long, may be 50% greater than the value in the above table.

3. Minimum Sight Distance - In the interest of public safety, no less than the minimum applicable sight distance shall be provided. Vertical curves that connect each change in grade shall be provided and calculated using the following parameters. Sight distance provided for stopped vehicles at intersections should be in accordance with "A Policy on Geometric Design of Highways and Streets, 1984."

SIGHT DISTANCE				
Design Speed	30	40	50	60
Stopping Sight Distance				
Minimum (ft.)	200	275	400	525
Desirable Minimum (ft.)	200	325	475	650
Minimum K* Value for:				
Crest Curve	30	80	160	310
Sag Curve	40	70	110	160

(General practice calls for vertical curves to be multiples of 50 feet. Calculated lengths shall be rounded up in each case.)

* K is a coefficient by which the algebraic difference in grade may be multiplied to determine the length in feet of the vertical curve which will provide the desired sight distance.

4. The "Superelevation Table" below shows the maximum degree of curve and related maximum superelevation for design speeds. The maximum rate of roadway superelevation (e) for rural roads with no curb and gutter is 0.08. The maximum rate of superelevation for urban streets with curb and gutter is 0.06, with 0.04 being desirable.

SUPERELEVATION TABLE			
Design Speed	Maximum e*	Minimum Radius ft.	Max. Deg. of Curve
30	0.04	302	19 00'
40	0.04	573	10 00'
50	0.04	955	6 00'
60	0.04	1,528	3 45'
30	0.06	273	21 00'
40	0.06	509	11 15'
50	0.06	849	6 45'
60	0.06	1,380	4 15'
30	0.08	252	22 45'
40	0.08	468	12 15'
50	0.08	764	7 30'
60	0.08	1,206	4 45'

e* = rate of roadway superelevation, foot per foot

D. Intersections

1. Streets shall be laid out so as to intersect as nearly as possible at right angles, and no street should intersect any other street at an angle less than sixty-five (65) degrees. No street should intersect a railroad at grade at an angle less than sixty-five (65) degrees.
2. Property lines at intersections should be set so that the distance from the edge of pavement, of the street turnout, to the property line will be at least as great as the distance from the edge of pavement to the property line along the intersecting streets. This property line can be established as a radius or as a sight triangle. Greater offsets from the edge of pavement to the property lines will be required, if necessary, to provide sight distance for the stopped vehicle on the side street.
3. Offset intersections are to be avoided. For intersections which cannot be aligned, Pitt County Subdivision Regulations require minimum offsets of 125 feet within subdivisions and 250' in other cases.

E. Cul-de-sacs

Cul-de-sacs shall not be more than seven hundred (700) feet in length. The distance from the edge of pavement on the vehicular turn-around to the right-of-way line should not be less than the distance from the edge of pavement to right-of-way line on the street approaching the turn-around. Cul-de-sacs should not be used to avoid connection with an existing street or to avoid the extension of an important street.

F. Alleys

1. Alleys shall be required to serve lots used for commercial and industrial purposes except that this requirement may be waived where other definite and assured provision is made for service access. Alleys shall not be provided in residential subdivisions unless necessitated by unusual circumstances.
2. The width of an alley shall be at least twenty (20) feet.
3. Dead-end alleys shall be avoided where possible, but if unavoidable, shall be provided with adequate turn-around facilities at the dead end as may be required by the Planning Board.

G. Permits For Connection To State Roads

An approved permit is required for connection to any existing state system road. This permit is required prior to any construction on the street or road. The application is available at the office of the District Engineer of the Division of Highways.

H. Offsets To Utility Poles

Poles for overhead utilities should be located clear of roadway shoulders, preferably a minimum of at least 30 feet from the edge of pavement. On streets with curb and gutter, utility poles shall be set back a minimum distance of 6 feet from the face of curb.

I. Wheelchair Ramps

All street curbs being constructed or reconstructed for maintenance purposes, traffic operations, repairs, correction of utilities, or altered for any reason, shall provide wheelchair ramps for the physically handicapped at intersections where both curb and gutter and sidewalks are provided and at other major points of pedestrian flow.

J. Horizontal Width on Bridge Deck

1. The clear roadway widths for new and reconstructed bridges serving 2 lane, 2 way traffic should be as follows:

- a. Shoulder section approach

- i. Under 800 ADT design year

Minimum 28 feet width face to face of parapets of rails or pavement width plus 10 feet, whichever is greater.

- ii. 800 - 2000 ADT design year

Minimum 34 feet width face to face of parapets of rails or pavement width plus 12 feet, whichever is greater.

- iii. Over 2000 ADT design year

Minimum width of 40 feet, desirable width of 44 feet width face to face of parapets of rails.

- b. Curb and gutter approach

- i. Under 800 ADT design year

Minimum 24 feet face to face of curbs.

- ii. Over 800 ADT design year

Width of approach pavement measured face to face of curbs.

Where curb and gutter sections are used on roadway approaches, curbs on bridges shall match the curbs on approaches in height, in width of face to face of curbs, and in crown drop. The distance from face of curb to face of parapet of rail shall be 1'6" minimum, or greater if sidewalks are required.



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2. The clear roadway widths for new and reconstructed bridges having 4 or more lanes serving undivided two-way traffic should be as follows:
 - a. Shoulder section approach - Width of approach pavement plus width of usable shoulders on the approach left and right. (Shoulder width 8' minimum, 10' desirable.)
 - b. Curb and gutter approach - Width of approach pavement measured face to face of curbs.

